ENERGATE
interactive energy management solutions

Installation Guide for Energate Thermostats

Pioneer and Foundation Marketing release 2.3 and 1.4, respectively

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Installation Guide for Energate Thermostats.

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July 2014

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1 Introduction

This document is intended for the use of installers who are installing the following Energate PCT thermostats that support the ZigBee Smart Energy protocol:

- FZ100 & FZ100C Foundation
- Z100 Pioneer 2

This document describes the typical installation scenarios and provides advice for handling unusual situations. For a description of how to operate the thermostat, see 1.1 Operating the Foundation Thermostat.

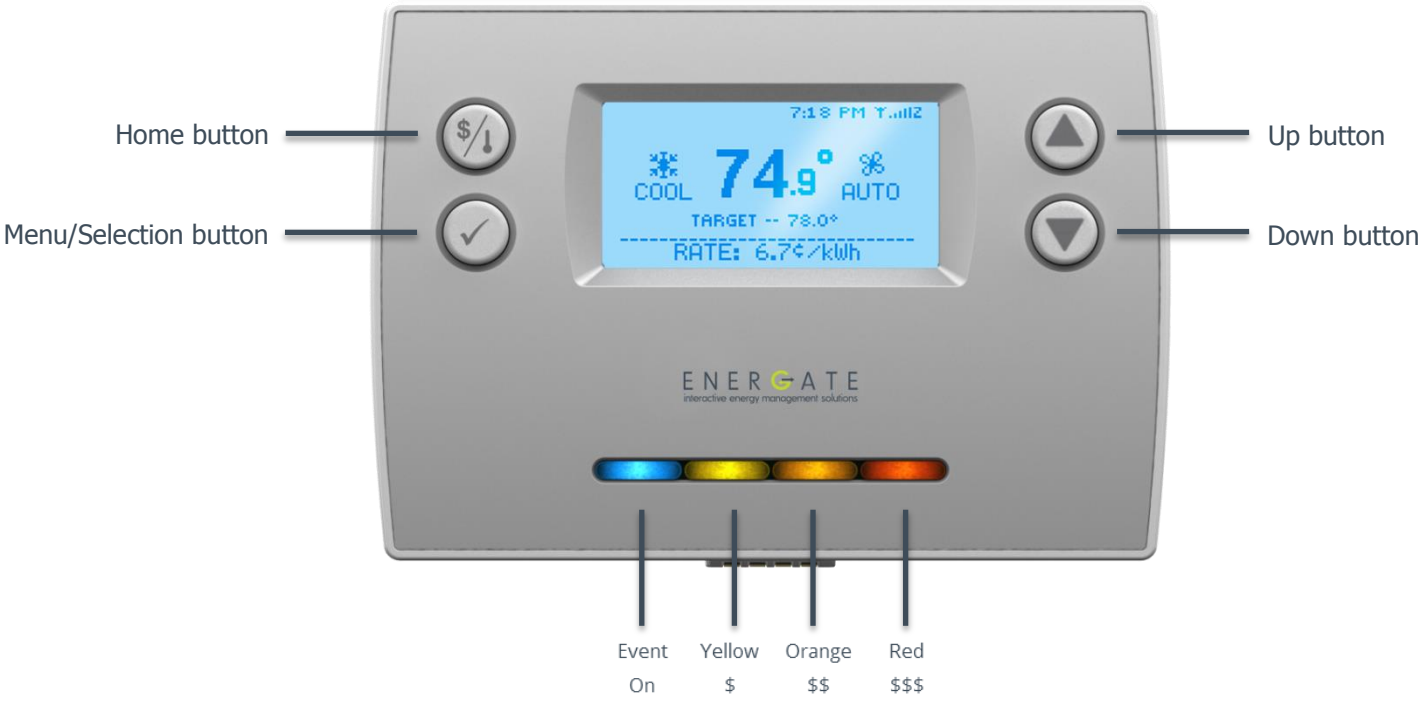
Some Foundation models offer additional features, such as the ability to collect electricity consumption information from an optional meter data collector attached to your electricity meter. This guide specifies the Foundation models that support them whenever these additional features are discussed.

Foundation model numbers are printed on the radio module on the back of the thermostat.

If you have questions that are not answered by this document, please contact Energate using the information provided in 13 Energate Technical Support.

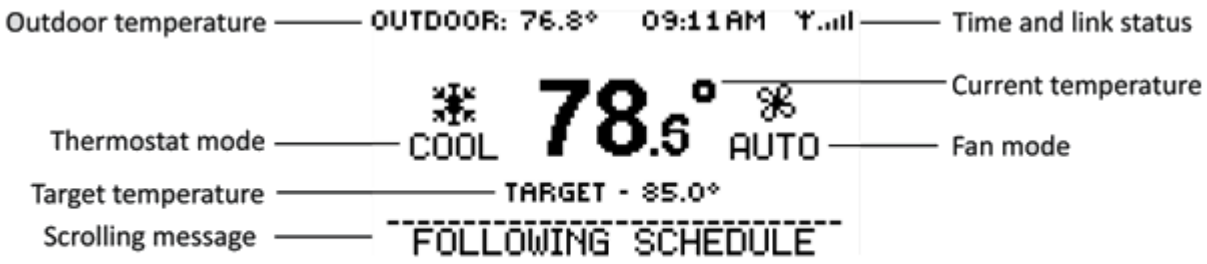
1.1 Operating the Foundation Thermostat

1.1.1 Navigating the Controls



Button	Button Name	Functions
	Home	• Switches between the **Thermostat** and the **Energy** mode home screens. • Exits and cancels any changes within a menu, and returns to the last visited home screen. • Wakes up the unit.
	Menu/Select ✓	• Displays a menu. • Selects the highlighted item. • Navigates to the next step in a wizard. • Confirms messages. • Wakes up the unit.
	Up ▲ **and** Down▼	• In the Thermostat mode, adjusts the target temperature. • In the Energy mode, adjusts conservation settings. • Moves the highlighted selection in a menu. • Wakes up the unit.

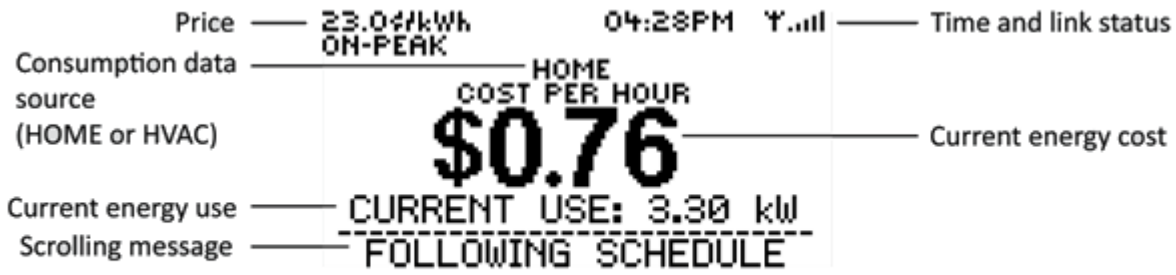
1.1.2 Thermostat Home Screen



Press the Home button to switch to the Energy home screen.

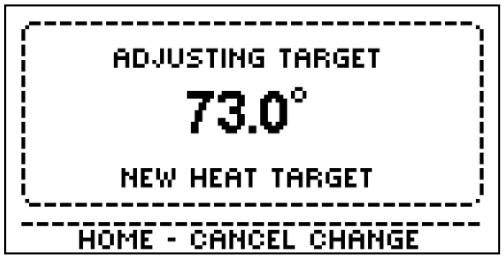
By default, the backlight dims when the Thermostat home screen switches to Standby mode.

1.1.3 Energy Home Screen



Press the Home button to switch to the Thermostat home screen.

1.1.4 Manually Setting the Temperature (Temporary Hold)



By default, the thermostat follows a schedule. Use the following steps to override the schedule using a temporary hold:

1. Press the Up ▲ or Down ▼ buttons to adjust the target temperature.

   This setting remains until the next setpoint change in your schedule. A setpoint is the start time for the change and its target temperature.

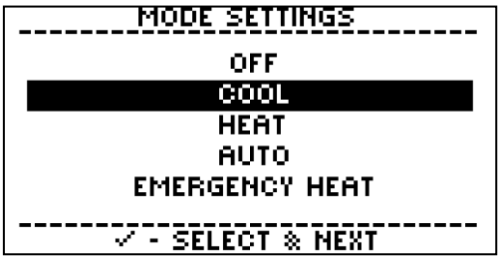
2. To cancel a hold, press the Up ▲ or Down ▼ buttons, and then press the Menu/Select ✓ button and follow the prompts.

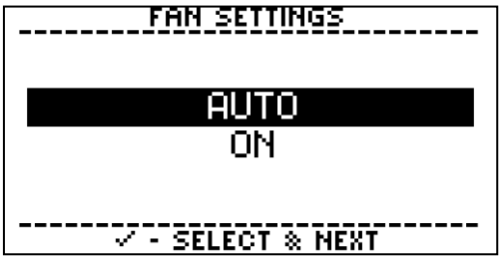
The Foundation thermostat can also operate using a fixed temperature, without a schedule. For information, see the user guide.

1.1.5 Changing the Thermostat Operating and Fan Modes

From the Thermostat home screen:

1. Press the Menu/Select ✓ button to wake up the thermostat, and press it again to display the main menu.
2. Press the Menu/Select ✓ button to select Mode & Fan Settings.
3. Use the Up ▲ or Down ▼ buttons to select the thermostat mode, and then press the Menu/Select ✓ button.
4. Use the Up ▲ or Down ▼ buttons to select **Yes** and then press the Menu/Select ✓ button to save the changes.

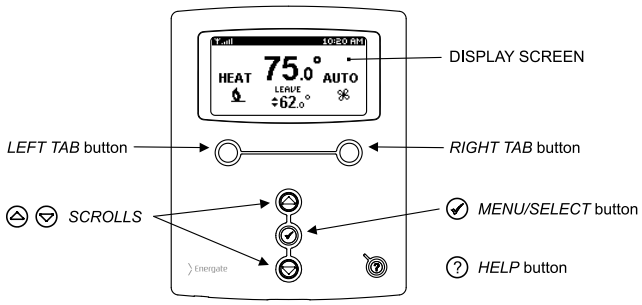




Note: Refer to the thermostat user manual for complete operating instructions.

1.2 Operating the Z100 Pioneer Thermostat

1.2.1 Navigating the Controls

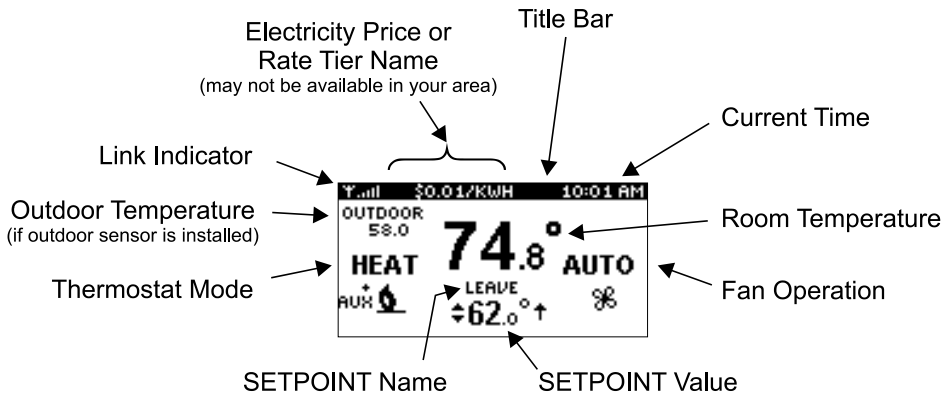


The function of the *LEFT* and *RIGHT TAB* buttons appears on the bottom of the display screen.

Use the *SCROLL* (▲ ▼) buttons to adjust the temperature, move through the menus options, and change highlighted values. Press the *MENU / SELECT* (√) button to access the menu, and to select or accept highlighted menu items.

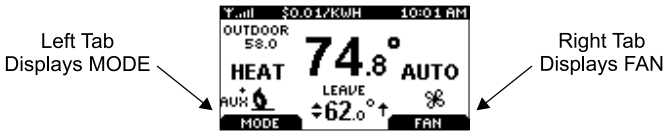
1.2.2 Home Screen

The Home screen displays current temperature and operation data. When the Home screen is in Sleep mode, the backlight is dimmed (actual brightness level is user-adjustable). Please note that icons such as heat or fan are animated when the equipment is running.



Note: A SETPOINT (e.g. LEAVE) is identified by a name and specifies both heating and cooling target temperatures. See the Temperature Settings section for additional information.

When you press any of the buttons, the Home screen becomes active, the backlight brightens, and the MODE and FAN tabs are shown.



Press the *LEFT TAB* button to change the thermostat mode (COOL/HEAT/AUTO/EMERG/OFF). The available options for the thermostat mode depend on the type of heating or cooling equipment at your home. Press the *RIGHT TAB* button to change the fan mode (ON/AUTO).

Press the *SCROLL* (▲ ▼) buttons to adjust the SETPOINT temperatures higher (warmer) or lower (cooler). To accept the changes, press the *LEFT TAB*, which displays ACCEPT, or do nothing. They are automatically accepted when the screen goes to the Sleep mode (that is, the backlight dims).

To display the menu items, press the *MENU / SELECT* (√) button once when the screen is active, or twice when it is in the Sleep mode.

Note: Refer to the thermostat user manual for complete operating instructions.

2 General Installation Procedures

1. Before installing the new thermostat or replacing an existing one, it is very important to test all heating and cooling stages to verify that the existing HVAC equipment is working correctly.

2. In general, the thermostat installation or replacement should not be attempted if the HVAC equipment does not appear to be working correctly, as this can lead to future misunderstandings with the home owner.

3. If this is a replacement installation, record the schedule and equipment settings for the existing thermostat. Label all the wires, and identify the terminals that they are connected to on the old thermostat, in case it needs to be re-installed.

4. If there is no existing thermostat, mount the thermostat and related equipment. See 3 New Installation.

5. For replacement installations, disconnect power from the HVAC equipment and remove the old thermostat.

6. Install the Energate thermostat as described in 5 Standard Configurations.

   If the thermostat backplate does not cover the hole in the wall, see 7.1 Wall Plate.

7. If there is no common (ground) wire, see 6.1 No Common Wire at Thermostat.

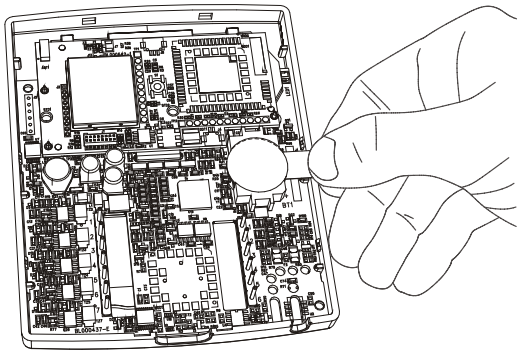
8. After you install the Energate thermostat, reconnect power and use the Installer Setup or Setup menu to configure the thermostat for the type of equipment that it is connected to. See

10. 4 Configuring the Thermostat Settings.
11. Verify that all the heating and cooling stages are working correctly. See 8 Testing the System.
12. If the thermostat uses an outdoor sensor, air filter sensor, or heat pump fault sensor, see 7 Options and Accessories.
13. If the HVAC equipment has two transformers, see 6.1.3 Dual Transformer .
14. To connect the HVAC equipment to a zone control system, see 6.2 Zone Control Systems.
15. Provision the thermostat to allow it to communicate with the ZigBee gateway or the optional Meter Data Collector or pager module. See.
16. Show the homeowner how to use their new thermostat as described in 1.1 Operating the Foundation Thermostat. In particular make sure they know how to:
    a. Change the mode between Heat, Cool, Auto and Off.
    b. Set a temporary hold, which they can also use to override an energy or price conservation event.
    c. Modify their conservation settings if the electricity provider is sending price information.
    d. Modify their schedule time and temperature settings.

    For answers to some common user questions, see 12.2 User Questions.
17. Explain how the electricity provider's demand response program works to the homeowner.
18. Provide the homeowner with the thermostat user guide and electric utility documentation.

3 New Installation

3.1 Removing battery tab on installation



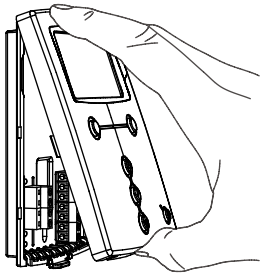
Remove back-plate from thermostat housing.
Grab battery-tab and pull away from the battery.
Do not touch ESD sensitive components unless properly grounded
(Pioneer thermostat is shown)

3.2 Mounting the Thermostat

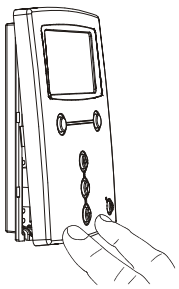
Install the thermostat at 5 feet (1.5m) above the floor in an area with good air circulation and an average temperature. Avoid locations with drafts, dead spots behind doors, hot or cold air ducts, sunlight or radiant heat from appliances, concealed pipes or chimneys, and unconditioned areas. For example, don't install the thermostat on an outside wall.

The two wallplate anchors should be spaced 3.5 inches (90 mm) apart in a vertical direction. Pull wires through the backplate and connect them to the appropriate terminals

3.2.1 Pioneer thermostat installation



Place thermostat housing as shown above.
It is very important to engage the top hinge first.

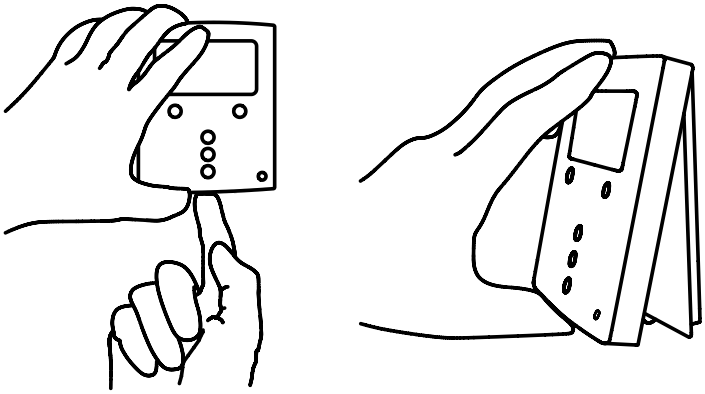


Press down at the bottom of the thermostat housing until the housing snaps into position.

CAUTION:
Do not press on the front housing as shown above.
This may cause the LCD to crack and/or break!

3.2.2 Removing Pioneer Z100 Thermostat Front Housing from Backplate

To remove the thermostat front housing from the backplate, press the plastic tab located at the bottom of the thermostat. Pull the bottom of the front housing forward and remove.



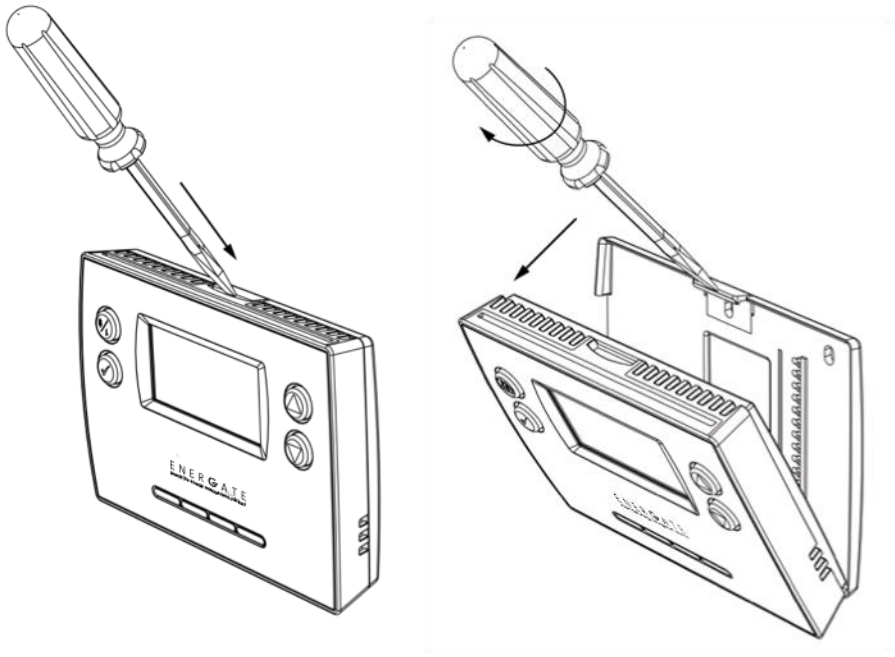
Warning: To avoid damaging the thermostat, **do not use metallic tools** to remove the Pioneer Z100 thermostat battery or backplate.

3.2.3 Placing the Foundation Thermostat on the Mounting Bracket

Push the bottom end of Foundation onto the mounting bracket until it snaps snugly into place before pushing the top end on.

3.2.4 Removing the Foundation Thermostat from the Mounting Bracket

1. Use a large flathead screwdriver or large coin to lift up the snap-fit tab located on top of the mounting bracket. Note: if the screwdriver is too small, the tab and/or thermostat housing can be damaged.



2. Lift the tab until Foundation is free to pull out.
3. Pull the top end of Foundation away from the mounting bracket until it is free of the snap-fit tab. Then lift Foundation free of the mounting bracket.

   Note: Be careful not to unplug any wiring that is still connected on the back.

3.2.5 Mounting the Outdoor Temperature Sensor

Mount the outdoor sensor in a shaded location, out of direct sunlight. The thermostat will automatically detect the outdoor sensor and display its readings. For Foundation thermostats, the outdoor sensor should be connected to terminals 10 and 11, see the diagram of Foundation backplate in Section 4. For Pioneer thermostats, the outdoor sensor should be connected to terminals 3 and 4, see the diagram of Pioneer backplate in Section 5.

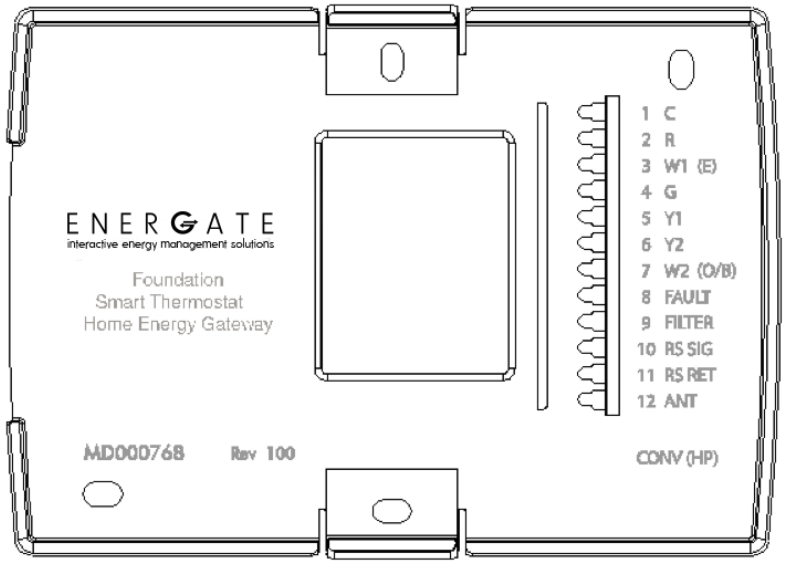
3.2.6 Cleaning the Thermostat

The thermostat can be cleaned with a soft cloth that is **lightly dampened** with isopropyl alcohol (IPA).

Warning: Excessive IPA or use of other solvents may damage the thermostat's LCD display.

3.3 Foundation Thermostat Wiring

The following diagram shows the backplate of the Foundation thermostat.



3.3.1 Conventional System

Common (GND)	C	1
Power (24VAC)	R	2
1st Stage Heat	W1	3
Fan	G	4
1st Stage Cool	Y1	5
2nd Stage Cool	Y2	6
2nd Stage Heat	W2	7
		8
Filter	FILTER	9
Outdoor Sensor Signal	RS SIG	10
Outdoor Sensor Return	RS RET	11
Antenna	ANT	12

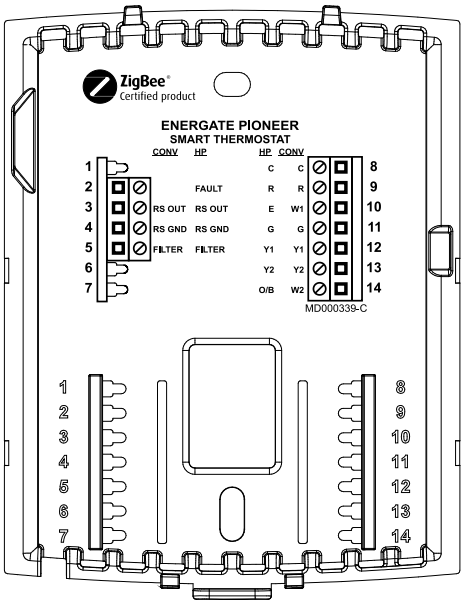
3.3.2 Heat Pump System

Common (GND)	C	1
Power (24VAC)	R	2
Emergency Heat	E	3
Fan	G	4
1st Stage Heat Pump	Y1	5
2nd Stage Heat Pump	Y2	6
Reversing/Changeover Valve	O/B	7
Heat Pump Fault	FAULT	8
Air Filter	FILTER	9
Outdoor Sensor Signal	RS SIG	10

Outdoor Sensor Return	RS RET	11
Antenna	ANT	12

3.4 Z100 Pioneer Thermostat Wiring

The following diagram shows the backplate of the Z100 Pioneer thermostat.



3.4.1 Conventional System

1			Common(GND)	C	8
2			Power (24VAC)	R	9
3	RS OUT	Outdoor Sensor	1st Stage Heat	W1	10
4	RS GND	Sensor Ground	Fan	G	11
5	FILTER	Filter	1st Stage Cool	Y1	12
6			2nd Stage Cool	Y2	13
7			2nd Stage Heat	W2	14

3.4.2 Heat Pump

1			Common (GND)	C	8
2	FAULT	Heat Pump Fault	Power (24VAC)	R	9
3	RS OUT	Outdoor Sensor	Auxiliary Heat	E	10
4	RS GND	Sensor Ground	Fan	G	11
5	FILTER	Filter	1st Stage Heat Pump	Y1	12
6			2nd Stage Heat Pump	Y2	13
7			Reversing Valve*	O/B	14
* Reversing Valve is also known as Changeover valve					

4 Configuring the Thermostat Settings

To configure the thermostat to match your HVAC configuration:

- For Foundation thermostats, go to the Installer Setup and Equipment Settings menus.
- For Pioneer Z100 thermostats, go to the Setup menu.

If required, use the password to access the additional menu items listed below. The default password is "INST".

For settings for specific equipment types and configurations, see the information under 5 Standard Configurations.

4.1 Conventional Settings

Setting	Description	Pioneer Menu	Foundation Menu
TYPE	Select the type of equipment (Conventional or Heat Pump), the default is Conventional.	Equipment Type	Equipment Settings
# OF COOL STAGES	Select the number of cool stages from 0 to 2. The default is 1.	Equipment Type	Equipment Settings
# OF HEAT STAGES	Select the number of heat stages from 0 to 2 (3 for heat pumps). The default is 1.	Equipment Type	Equipment Settings
MIN ON/OFF TIME For Heating	Select the minimum on/off time from 1 to 6 minutes. The default is 2. **Note:** A minimum of 2 minutes is recommended for a furnace and 3 minutes for heat pumps and air conditioners.	Equipment Cycling	Equipment Settings
MIN ON/OFF TIME For Cooling	Select the minimum on/off time from 1 to 6 minutes. The default is 4. **Note:** A minimum of 2 minutes is recommended for a furnace and 3 minutes for heat pumps and air conditioners.	Equipment Cycling	Equipment Settings
Heat Max Cycles	Select the Maximum Cycles/ Hour from 1 to 12 Cycles/ Hour. The Default is 6	Equipment Cycling	Equipment Settings
Cool Max Cycles	Select the Maximum Cycles/ Hour from 1 to 12 Cycles/ Hour. The Default is 4	Equipment Cycling	Equipment Settings
FAN ON IN HEAT	Set to Yes if the thermostat controls the fan (common in electric furnaces). Set to No if the furnace controls the fan (common in gas furnaces). The default is Yes.	Equipment Settings	Equipment Settings

HYSTERISIS	Select the number of degrees that the temperature must go beyond a setpoint before changing between HEAT and COOL mode when in AUTO mode. The range is 0 °F (0 °C) to 6 °F (3 °C). The default is 2 °F (1 °C).	Control	Equipment Settings
ANTICIPATION TIME	Select the amount of time the thermostat will engage the equipment to reach the setpoint temperature before the scheduled setpoint time. Set the Anticipation Time to 0 if you do not want the equipment to turn on before the scheduled setpoint time. The range is from 0 to 180 minutes. The default is 60 minutes.	Control	Equipment Settings
MAX RECOVERY TIME	For multiple-stage equipment. Select the amount of time the thermostat will allow the equipment to reach the desired temperature in the current stage before engaging the next heating or cooling stage. The range is 0 to 180 minutes. The default is 90 minutes.	Control	Equipment Settings

4.2 Heat Pump Settings

Setting	Description	Pioneer Menu	Foundation Menu
REV. VALVE	Select whether the reversing valve is on in cool or on in heat. The default is On in Cool.	Equipment Type	Equipment Settings
TYPE	Select the type of equipment (Conventional or Heat Pump), the default is Conventional.	Equipment Type	Equipment Settings
# OF COOL STAGES	Select the number of cool stages from 0 to 2. The default is 1.	Equipment Type	Equipment Settings
# OF HEAT STAGES	Select the number of heat stages from 0 to 2 (3 for heat pumps). The default is 1.	Equipment Type	Equipment Settings
AUX. Heat MIN ON/OFF TIME	Select the minimum on/off time from 1 to 6 minutes. The default is 2. **Note:** A minimum of 2 minutes is recommended for a furnace and 3 minutes for heat pumps and air conditioners.	Equipment Cycling	Equipment Settings
Heat Pump MIN ON/OFF TIME	Select the minimum on/off time from 1 to 6 minutes. The default is 4. **Note:** A minimum of 2 minutes is recommended for a furnace and 3 minutes for heat pumps and air conditioners.	Equipment Cycling	Equipment Settings
AUX. Heat Max Cycles	Select the Maximum Cycles/ Hour from 1 to 12 Cycles/ Hour. The Default is 6	Equipment Cycling	Equipment Settings
Heat pump Max Cycles	Select the Maximum Cycles/ Hour from 1 to 12 Cycles/ Hour. The Default is 4	Equipment Cycling	Equipment Settings

HYSTERISIS	Select the number of degrees that the temperature must go beyond a setpoint before changing between HEAT and COOL mode when in AUTO mode. The range is 0 °F (0 °C) to 6 °F (3 °C). The default is 2 °F (1 °C).	Control	Equipment Settings
ALLOW HP+AUX ON	Set to Yes if the heat pump and auxiliary heat can be on at the same time (common with auxiliary electric heat). Set to No if the heat pump should be off when the auxiliary heat is on (common with auxiliary fossil fuel heat). The default is Yes.	Equipment Settings	Equipment Settings
BALANCE POINTS	Heat Pump without outdoor temperature sensor: If available, use the values for your specific equipment. Otherwise, use the default values.	Equipment Settings	Equipment Settings
	Heat Pump with outdoor temperature sensor: HIGH: Set to the temperature above which the auxiliary heat is disabled. The range is from -38°F (-39°C) to 122°F (50°C). A typical value is 50°F (10°C). LOW: Set to the temperature below which the heat pump is disabled. The range is from -40°F (-40°C) to 120°F (49°C). A typical value is 32°F (0°C). Default values are High: 122°F (50°C) and Low: -40°F (-40°C).		

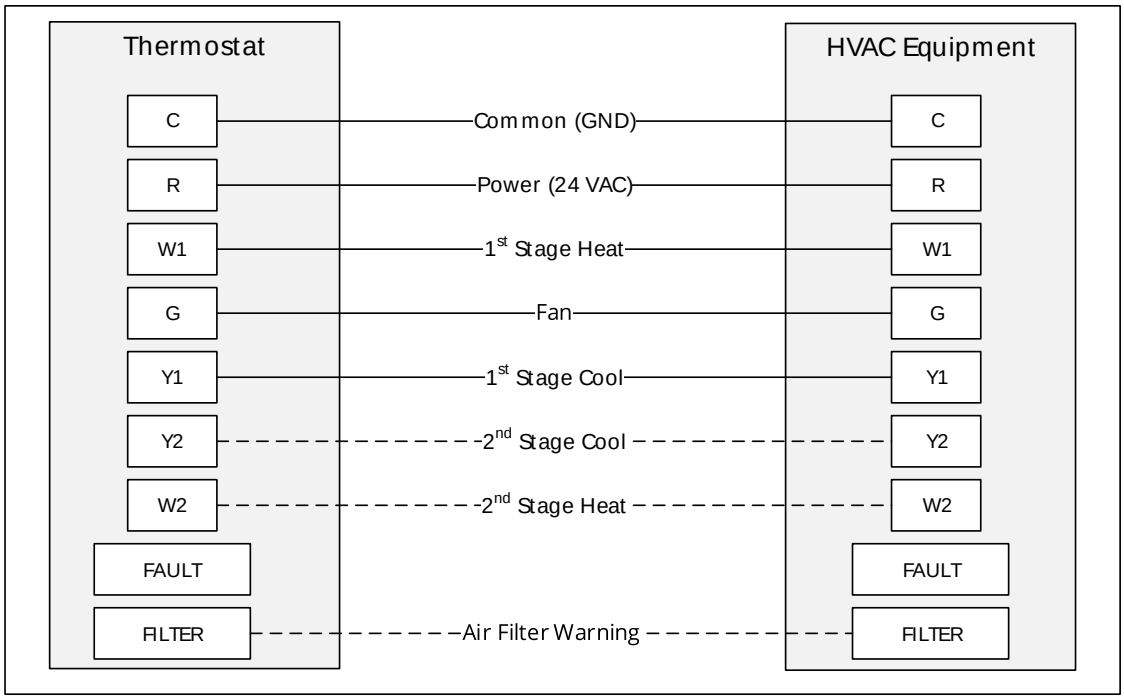
ANTICIPATION TIME	Select the amount of time the thermostat will engage the equipment to reach the setpoint temperature before the scheduled setpoint time. Set the Anticipation Time to 0 if you do not want the equipment to turn on before the scheduled setpoint time. The range is from 0 to 180 minutes. The default is 60 minutes.	Control	User Options
MAX RECOVERY TIME	For multiple-stage equipment. Select the amount of time the thermostat will allow the equipment to reach the desired temperature in the current stage before engaging the next heating or cooling stage. The range is 0 to 180 minutes. The default is 90 minutes.	Control	Equipment Settings

5 Standard Configurations

This section provides typical wiring configurations for common HVAC units. A solid line is required, and a dashed line is optional depending on the HVAC configuration.

5.1 Furnace with Air Conditioner

5.1.1 Equipment Wiring

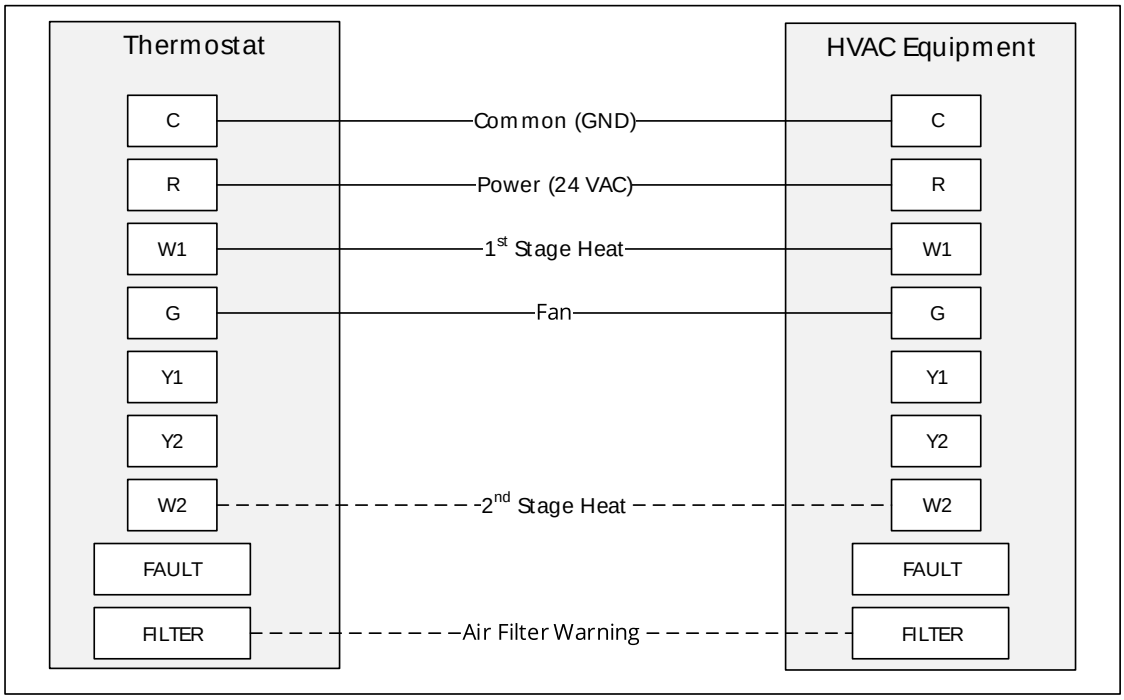


5.1.2 Thermostat Equipment Settings

Setting	Value
EQUIPMENT TYPE	Conventional
# OF COOL STAGES	1 for single-stage air conditioner, 2 for two-stage air conditioner The default is 1.
# OF HEAT STAGES	1 for single-stage furnace, 2 for two-stage furnace. The default is 1.
FAN ON IN HEAT	Set to Yes if the thermostat controls the fan (common in electric furnaces) and No if the furnace controls the fan (common in gas furnaces).

5.2 Furnace with No Air Conditioner

5.2.1 Equipment Wiring

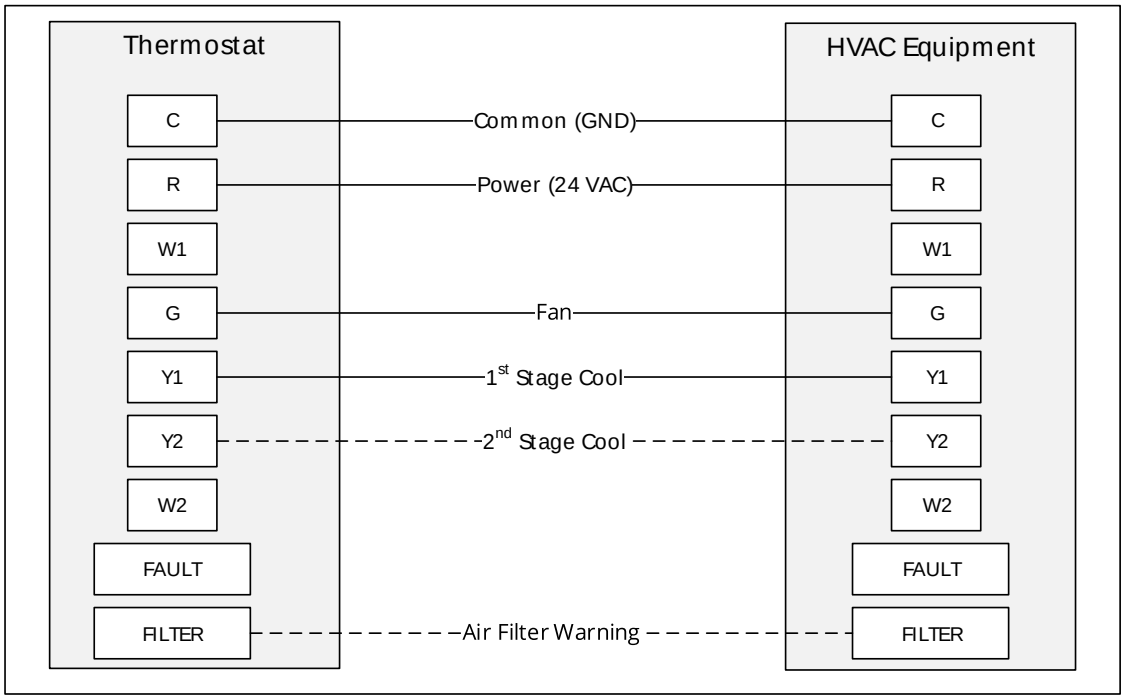


5.2.2 Thermostat Equipment Settings

Setting	Value
EQUIPMENT TYPE	Conventional
# OF COOL STAGES	0
# OF HEAT STAGES	1 for single-stage furnace, 2 for two-stage furnace.
FAN ON IN HEAT	Set to Yes if the thermostat controls the fan (common in electric furnaces) and No if the furnace controls the fan (common in gas furnaces).

5.3 Air Conditioner with No Furnace

5.3.1 Equipment Wiring

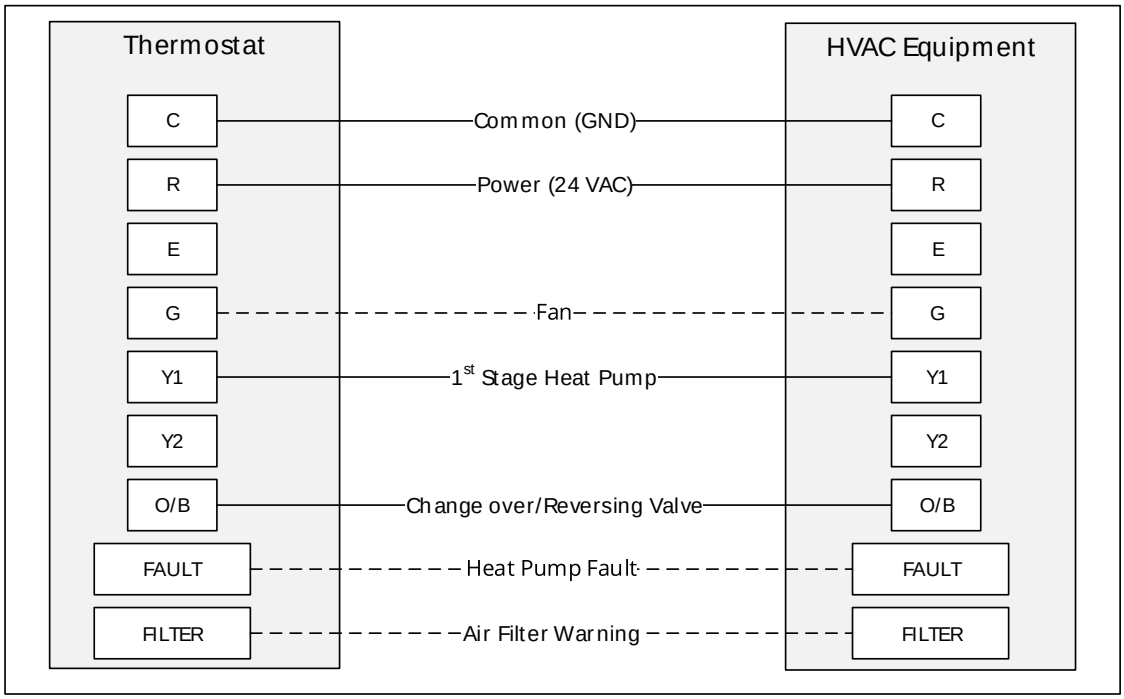


5.3.2 Thermostat Equipment Settings

Setting	Value
EQUIPMENT TYPE	Conventional
# OF COOL STAGES	1 for single-stage air conditioner, 2 for two-stage air conditioner.
# OF HEAT STAGES	0

5.4 Heat Pump: Single-Stage with No Auxiliary Stage

5.4.1 Equipment Wiring

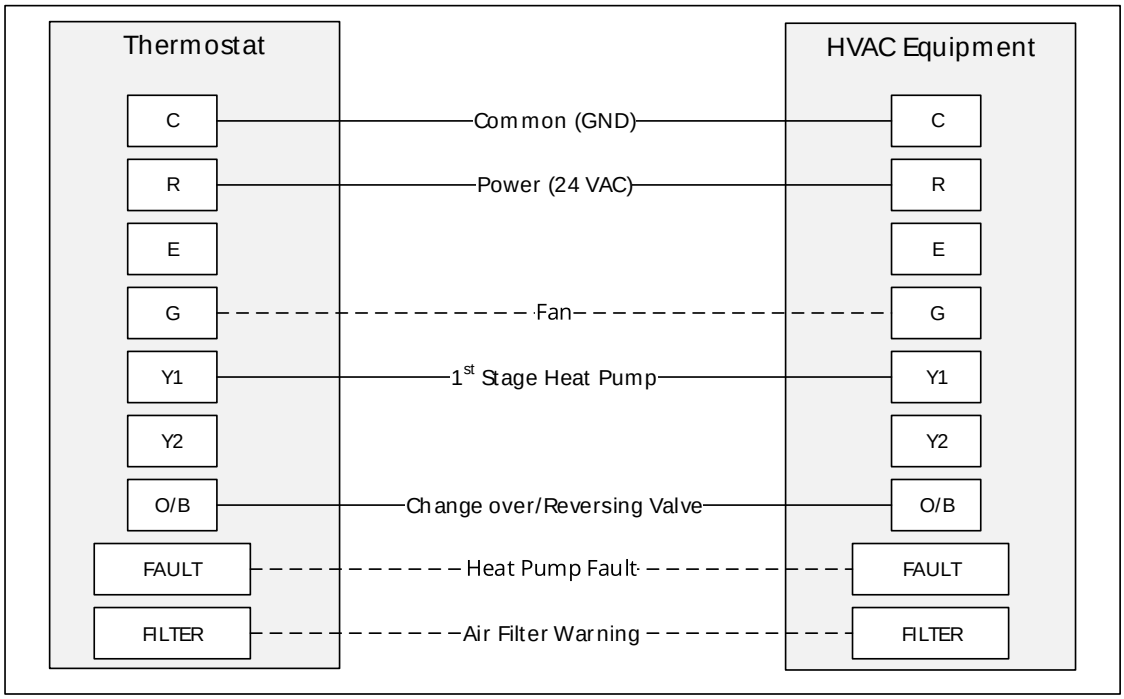


5.4.2 Thermostat Equipment Settings

Setting	Value
EQUIPMENT TYPE	Heat Pump
# OF COOL STAGES	1
# OF HEAT STAGES	1
REV. VALVE	Select whether the reversing valve is on in cool or on in heat. The default is On in Cool.

5.5 Heat Pump: Two-Stage with No Auxiliary Stage

5.5.1 Equipment Wiring

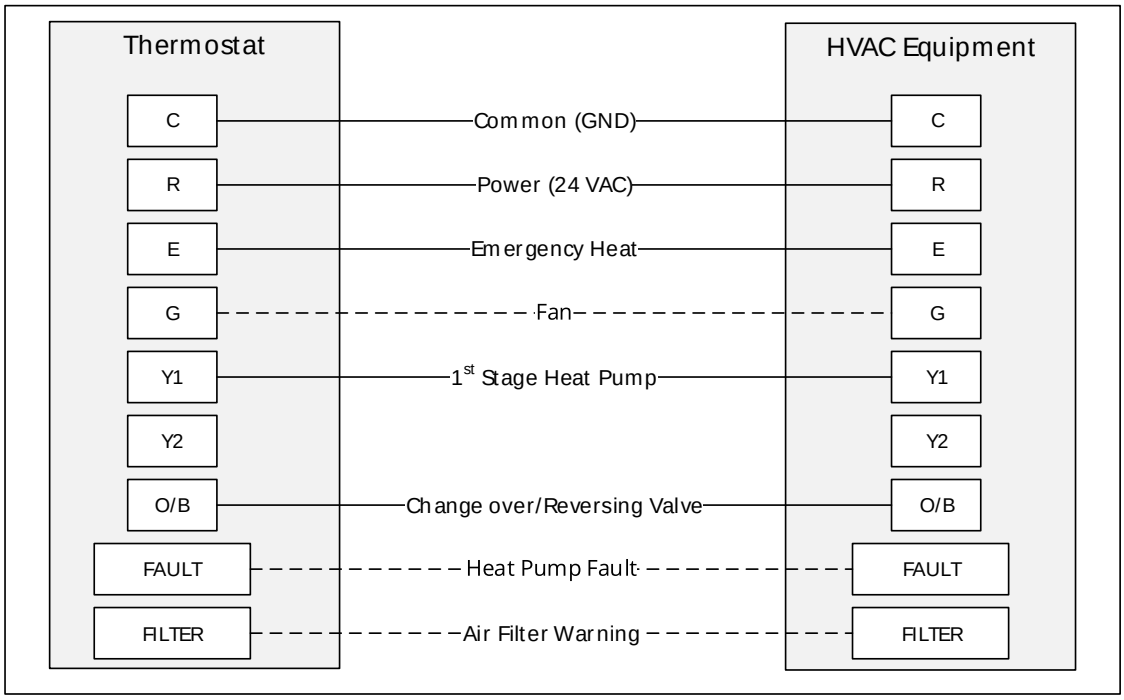


5.5.2 Thermostat Equipment Settings

Setting	Value
EQUIPMENT TYPE	Heat Pump
# OF COOL STAGES	2
# OF HEAT STAGES	2
REV. VALVE	Select whether the reversing valve is on in cool or on in heat. The default is On in Cool.

5.6 Heat Pump: Single-Stage with Auxiliary Stage

5.6.1 Equipment Wiring

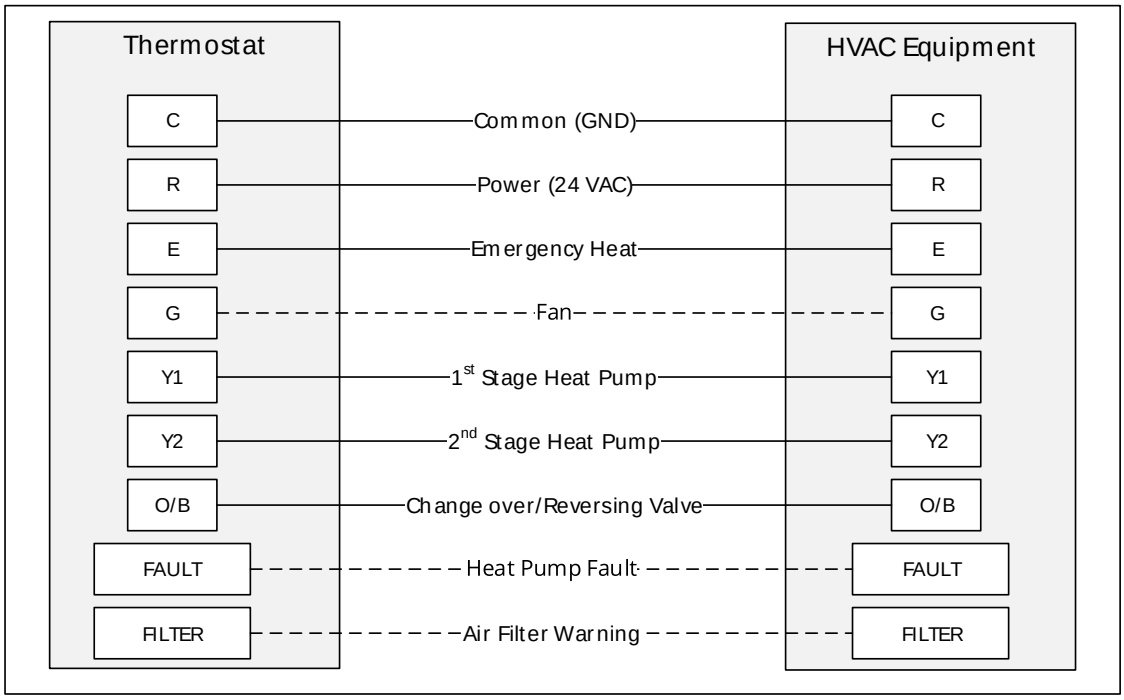


5.6.2 Thermostat Equipment Settings

Setting	Value
EQUIPMENT TYPE	Heat Pump
# OF COOL STAGES	1
# OF HEAT STAGES	2
REV. VALVE	Select whether the reversing valve is on in cool or on in heat. The default is On in Cool.
ALLOW HP+AUX ON	Set to Yes if the heat pump and auxiliary heat can be on at the same time (common with auxiliary electric heat). Set to No if the heat pump should be off when the auxiliary heat is on (common with auxiliary fossil fuel heat).
BALANCE POINTS	Without outdoor temperature sensor: • If available, use the values for your specific equipment. Otherwise, use the default values. Heat Pump with outdoor temperature sensor: • HIGH: Set to the temperature above which the auxiliary heat is disabled. The range is from -38°F (-39°C) to 122°F (50°C). A typical value is 50°F (10°C). • LOW: Set to the temperature below which the heat pump is disabled. The range is from -40°F (-40°C) to 120°F (49°C). A typical value is 32°F (0°C).

5.7 Heat Pump: Two-Stage with Auxiliary Stage

5.7.1 Equipment Wiring



5.7.2 Thermostat Equipment Settings

Setting	Value
EQUIPMENT TYPE	Heat Pump
# OF COOL STAGES	2
# OF HEAT STAGES	3
REV. VALVE	Select whether the reversing valve is on in cool or on in heat. The default is On in Cool.
ALLOW HP+AUX ON	Set to Yes if the heat pump and auxiliary heat can be on at the same time (common with auxiliary electric heat). Set to No if the heat pump should be off when the auxiliary heat is on (common with auxiliary fossil fuel heat).
BALANCE POINTS	Without outdoor temperature sensor: • If available, use the values for your specific equipment. Otherwise, use the default values. Heat Pump with outdoor temperature sensor: • HIGH: Set to the temperature above which the auxiliary heat is disabled. The range is from -38°F (-39°C) to 122°F (50°C). A typical value is 50°F (10°C). • LOW: Set to the temperature below which the heat pump is disabled. The range is from -40°F (-40°C) to 120°F (49°C). A typical value is 32°F (0°C).

6 Special Configurations

6.1 No Common Wire at Thermostat

Energate thermostats require a common wire.

If a common wire is not available on the thermostat backplate, do one of the following:

- If the HVAC system is a dual-transformer system (two transformers), install an Energate Auxiliary Switch AS20. See 6.1.1 Installing the Auxiliary Switch (AS20).

OR

- If a spare wire is available, run it from the equipment to the thermostat backplate. See 6.1.2 Running a Common (Ground) Wire.

6.1.1 Installing the Auxiliary Switch (AS20)

The Auxiliary Switch facilitates the installation of a thermostat where a common wire connection from the heating and/or cooling equipment to the thermostat does not exist.

These **single transformer** instructions should be used with a Heat-only HVAC installation, or with an integrated Heat/Cool installation that uses a single transformer to service both Heat and Cool parts of the equipment. For installations with separate Heating and Cooling equipment, each with its own transformer, see 6.1.3 Dual Transformer .

The Auxiliary Switch is installed on or close to the equipment so that the five wire cable reaches the control terminals inside. The Auxiliary Switch **should not be installed inside** the HVAC equipment enclosure (doing so may void the HVAC UL certification).

Before Starting the Installation:
Check that the package includes 1 Auxiliary Switch Unit, 1 signal coupler and 5 Splice Wire Caps.

Turn off the power to the furnace, air conditioning and/or heat pump, either at the shut-off switch, or at the electrical panel.

Thermostat site:
Step 1 - Remove the old thermostat from the backplate. If there is no backplate then remove the thermostat from the wall to access the wiring. Next, label the wires according to which terminal block they connect to (R,Y,W,G). Then disconnect the wires and remove the existing backplate.

Step 2 – Mount the new backplate and connect the wire marked R to the R terminal block. Also connect the wires labelled W and Y to the corresponding terminal blocks.

Step 3 – Install the signal coupler provided with the Auxiliary Switch between G and C terminal blocks on the backplate.

Twist the signal coupler wire with the wire labelled G to ensure that it is held securely.

Connect the wire labelled G to the C terminal block. Any remaining wires should be connected as per their installation instructions.

Step 4 – Make note of the color and/or labels on the wires attached to each of the terminal blocks. Attach the thermostat to the backplate.

Equipment site:
Step 5 – In the equipment area, find a convenient location to mount the Auxiliary Switch. The location should be **outside** the equipment but close enough so that the five wire cable reaches the thermostat connections inside. Mount the Auxiliary Switch using 2 screws or adhesive pad provided.

Step 6 – Before disconnecting wires at the equipment, label them according to which equipment terminal block they are connected, verifying that these labels match the labels you attached in step 1.

Step 7 – Pass the five wire cable through a convenient access hole in the equipment.

Step 8 – The wire labelled G must be spliced to the Auxiliary Switch cable using a wire cap as follows:
- Wire labelled G to the Auxiliary Switch **WHITE** wire.

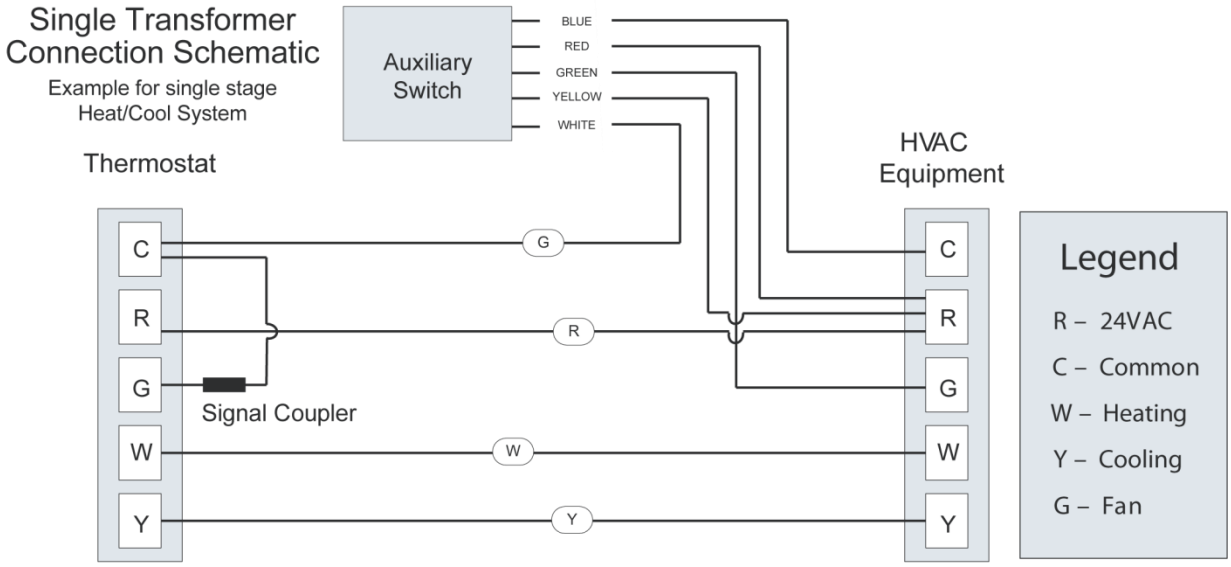
Step 9 – Connect the blue and green wires from the Auxiliary Switch to the equipment as follows:
- **BLUE** wire to the equipment C terminal.
- **GREEN** wire to the equipment G terminal.

Step 10 – Connect the remaining two wires from the Auxiliary Switch and the wire labelled R from the thermostat as follows:
- Auxiliary Switch **YELLOW** and **RED** wires and the wire labelled R to the equipment R terminal.

Step 11 – Restore power to the equipment and follow the equipment configuration instructions in the thermostat user manual for testing.

Step 12 - Record the serial number of the unit, name and address of the owner, and make and model of the heating and/or cooling equipment. Install the Connection Diagram sticker (AW000785) on a visible place on the HVAC cabinet or on the wall close to the Auxiliary Switch.

Note: If the old thermostat has no connection to G, but instead to W, then connect the W wire to C at the thermostat and the signal coupler between W and C at the thermostat location. At the equipment location, connect the Auxiliary Switch green wire to W instead of G at the equipment. Connect the Auxiliary Switch White wire to the W wire with a wire cap at the equipment location.



6.1.2 Running a Common (Ground) Wire

If a common wire is not available at the thermostat and the installer determines that it is more efficient to run a fresh common wire from the HVAC equipment transformer or simply does not have an auxiliary switch available, take the following precautions:

- Use the common or ground wire of the transformer of the HVAC equipment.
- Avoid problem with the thermostat, do not use a floating or incorrect common wire.
- If a common wire is run and power is not available at the thermostat, one of the wires may be faulty. This is more likely in older houses. In that case, it is recommended to test for continuity on the wires. If no continuity is detected, the wiring likely needs to be replaced.

  To test for continuity, replace the original wire with a spare wire (if available) and retest. If the new wire works, the old wire is likely faulty, and should be replaced.
- It is also possible that the wiring has been modified over time. Twist-on wire connectors (such as Marrette or Marr connectors) or couplers may have been used to couple the wires, and it is likely that the wiring at one end is a different color than the wiring at the other. In this case, to determine where the problem lies, record the colors and trace them from the HVAC equipment to the backplate.
- To help isolate faults, disconnect the thermostat, jumper R, and the output that you are testing. To avoid damaging the thermostat, remove the jumper before connecting the thermostat.

6.1.3 Dual Transformer Equipment

The following procedures describe how to install an AS20 Auxiliary Switch for HVAC equipment that has two transformers, with or without a common wire.

The Auxiliary Switch facilitates the installation of a thermostat in a Dual-transformer HVAC system, regardless of whether a common wire connection from the equipment to the thermostat is available.

These **dual-transformer** instructions should be used with installations incorporating separate Heat and Cool equipment, each with its own transformer. For a Heat-only HVAC installation or an integrated Heat/Cool installation using a single transformer servicing both Heat and Cool parts of the equipment, please refer to 6.1.1 Installing the Auxiliary Switch (AS20).

The Auxiliary Switch is installed on or close to the equipment so that the five wire cable reaches the control terminals inside. The Auxiliary Switch **should not be installed inside** the HVAC equipment enclosure (doing so may void the HVAC UL certification).

Before Starting the Installation:
Check that the package includes 1 Auxiliary Switch Unit, 1 signal coupler and 5 Splice Wire Caps.

Turn off the power to the furnace, air conditioning and/or heat pump, either at the shut off switch, or at the electrical panel.

Thermostat site:
Step 1 - Remove the old thermostat from the backplate. If there is no backplate, then remove the thermostat from the wall to access the wiring. Next, label the wires according to which terminal block they connect to (R,Y,W, and G). Now disconnect the wires and remove the existing backplate.

Step 2 – Mount the new backplate and connect the wire labelled RC to the R terminal block.

Step 3 – Install the signal coupler provided with the Auxiliary Switch between W and C terminal blocks on the backplate. Twist the signal coupler wire with the wire labelled W to ensure that it is held securely.

Connect the wire labelled W to the C terminal block. Any remaining wires should be connected as per their installation instructions.

Step 4 – Make note of the color and/or labels on the wires attached to each of the terminal blocks. Attach the thermostat to the backplate.

Equipment site:
Step 5 – In the equipment area, find a convenient location to mount the Auxiliary Switch. With separate equipment, it is generally advantageous to mount the Auxiliary Switch at the Cooling equipment. The location should be **outside** the equipment but close enough so that the five wire cable reaches the thermostat connections inside. Mount the Auxiliary Switch using 2 screws or adhesive pad provided.

Step 6 – Before disconnecting wires at the equipment, label them according to which equipment terminal block they are connected, verifying these labels match the labels attached in step 1.

Step 7 – Pass the five wire cable from the Auxiliary Switch through a convenient access hole in the equipment.

Step 8 – The wires labelled RC and W must be spliced to the Auxiliary Switch cable and equipment as follows:

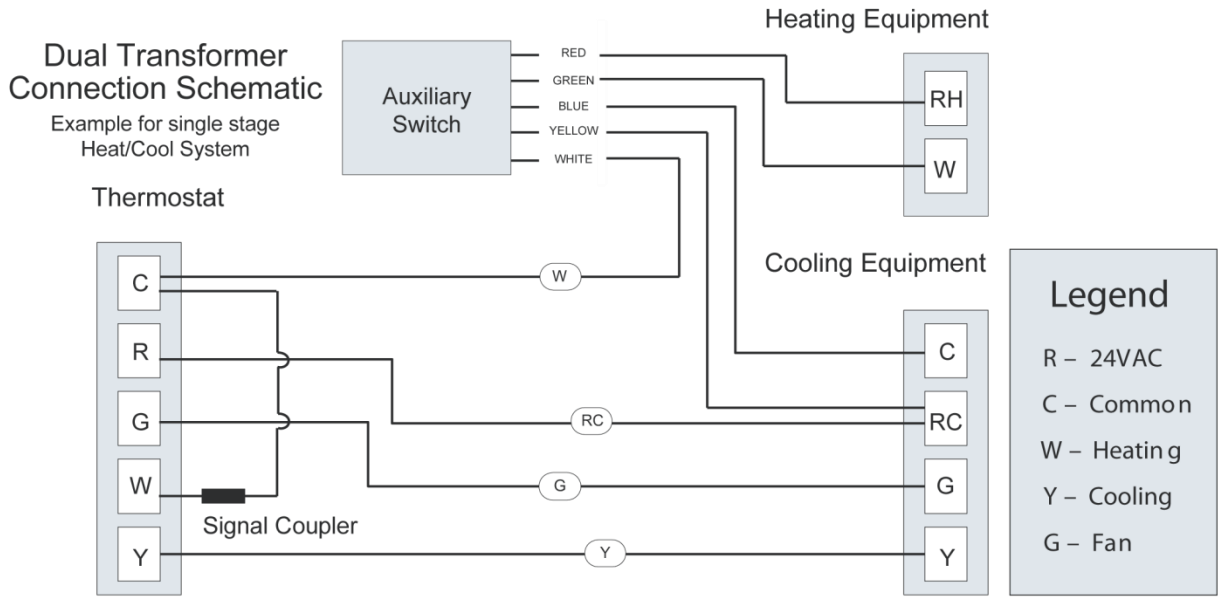
- Wire labelled RC and Auxiliary Switch **YELLOW** wire both to the Cooling equipment RC terminal.
- Wire labelled W to the Auxiliary Switch **WHITE** wire.

Step 9 – Connect the three remaining wires from the Auxiliary Switch to the furnace as follows:

- **RED** wire to the Heating equipment RH terminal.
- **GREEN** wire to the Heating equipment W terminal.
- **BLUE** wire to the Cooling equipment C terminal.

Step 10 – Restore power to the equipment and follow the equipment configuration instructions in the thermostat user manual for testing.

Step 11 - Record the serial number of the unit, name and address of the owner, and make and model of the heating and/or cooling equipment. Install the Connection Diagram sticker (AW000785) on a visible place on the HVAC cabinet or on the wall close to the Auxiliary Switch.



6.2 Zone Control Systems

An out-of-the-box Energate thermostat is compatible with most zone control systems. Each zone requires a separate thermostat, because a single Energate thermostat is not capable of supporting multiple zones by itself.

To use it with a typical zoning panel, connect the R, C, and other inputs as appropriate to the zone control wiring panel. For each zone, there should be an appropriate array of terminals similar to those normally located on the wiring panel of the HVAC equipment.

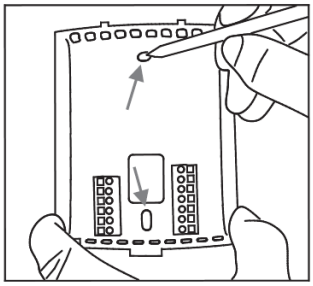
Treat each array of terminals, one for each thermostat zone, as a separate piece of HVAC equipment, and follow the instructions from earlier in this guide for that type of HVAC equipment.

7 Options and Accessories

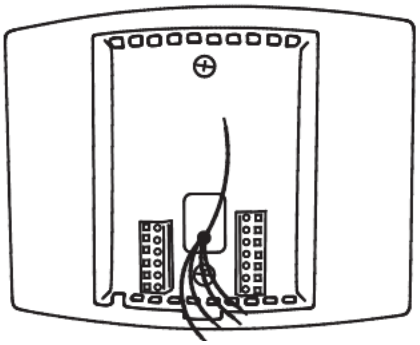
7.1 Wall Plate

If the Energate Foundation or Z100 Pioneer thermostat does not cover the hole in the wall left by the previous thermostat, you can use an Energate wall plate to completely cover most holes. You can position the wall plate either vertically and horizontally.

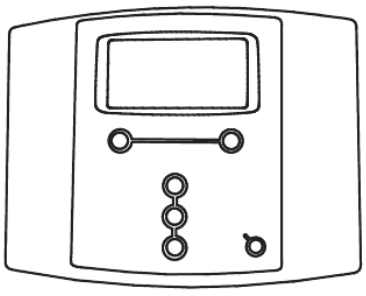
1. Using the Backplate of the thermostat as a template, mark the drywall to locate the two holes to be drilled.



2. Drill two 7/32” holes in the drywall and insert the wall anchors in the holes.
3. Align and mount the Wall plate and Thermostat Backplate using the two screws provided in the kit.



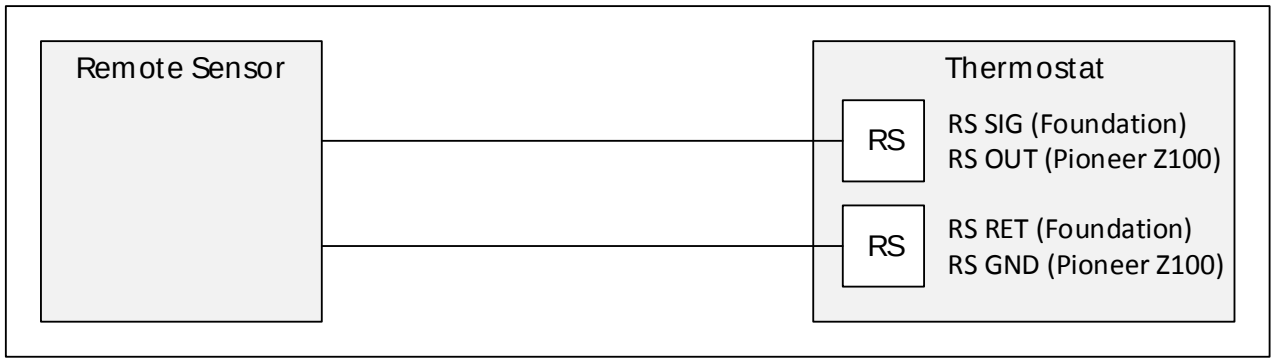
4. Feed the wires through the slot in the center.
5. Connect the wires as required and attach the Housing to the Thermostat Backplate.



The existing opening in the wall may not allow you to securely mount the thermostat. If this is the case insert one or two pieces of wood behind the drywall and attach them to the drywall, ensuring that the wall plate covers the screws. The pieces of wood can now be used to firmly mount the Wall plate and thermostat.

7.2 Outdoor Temperature Sensor

Energate recommends a sensor using a 10 kOhm (at 25 °C) thermistor with a B25/85 value of 3977, such as the Aprilaire 8052.



1. Do one of the following:

   For the Foundation thermostat:

   - Remove the thermostat from the backplate. See 3.2.4 Removing the Foundation Thermostat from the Mounting Bracket.
   - Connect one wire of the remote sensor to the RS SIG input terminal on the thermostat backplate.
   - Connect the other remote sensor wire to the RS RET input terminal.

   For the Pioneer thermostat:

   - Remove the thermostat from the backplate. See 3.2.2 Removing Pioneer Z100 Thermostat Front Housing from Backplate.
   - Connect one wire of the remote sensor to the RS OUT input terminal on the thermostat backplate.
   - Connect the other remote sensor wire to the RS GND input terminal.

2. Remount the thermostat.
3. After a few seconds, confirm that the outdoor temperature is displayed on the home screen.

7.3 Air Filter Sensor

HVAC equipment can have an air filter sensor that closes a contact to 24 VAC to signal that the filter is dirty and should be changed.

You can wire this sensor to the thermostat's FILTER terminal. When it receives the signal, the thermostat displays a Change Air Filter message to indicate to the user that he or she should replace or clean the filter.

7.4 Heat Pump Fault Sensor

HVAC equipment can have a heat pump fault sensor that closes a contact to 24 VAC to signal a problem with the heat pump.

You can wire this sensor to the thermostat's FAULT terminal. When it receives the signal, the thermostat displays a Heat Pump Fault message and does not engage the heat pump until the fault is corrected.

Note: Energate thermostats may not be compatible with all heat pump fault sensors.

7.5 ZIP Connect

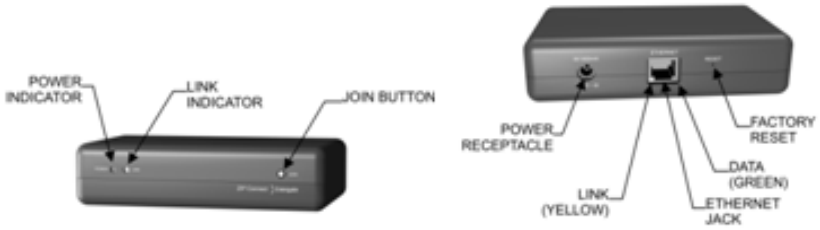
Energate ZIP Connect is a ZigBee device that allows the thermostat to receive information about utility events and consumption via the Internet.

The ZIP Connect uses a home's broadband Internet connection, such as a DSL connection supplied by a phone company or a cable internet service. It does not work with a dial-up connection.

The ZIP Connect RESET button clears the memory of the ZIP Connect to its factory defaults. Use it only when you are instructed to by your service provider.

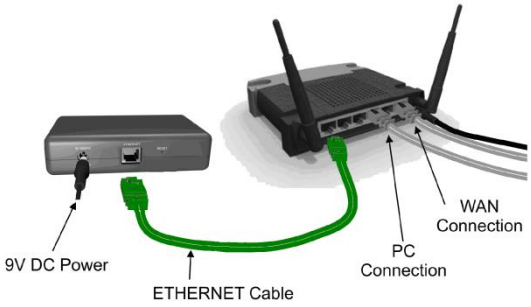
7.5.1 ZIP Connect Placement

The ZIP Connect contains a powerful 100 mW wireless ZigBee radio transceiver. However, like a cordless phone, its operation can be affected by its placement in the home. For best results, choose a spot away from other wireless equipment, computers, televisions and large appliances.



7.5.2 Install ZIP Connect

1. Plug the 9Vdc power supply into a wall outlet and connect it to the ZIP Connect. The amber light (LINK) on the front illuminates.
2. Use the Ethernet cable to connect the ZIP Connect to your broadband router.
3. Ensure that the router is powered up and operational, and that the amber light on the ZIP Connect's Ethernet jack (at the back) illuminates to indicate a connection to the router.
4. Under normal operating conditions, both lights at the front (amber LINK and green POWER) should be on continuously (not flashing). It may take a few minutes from power-up for this condition to be reached.



For information on provisioning and troubleshooting the ZIP Connect, see *CCDR-LMS Guide*

7.6 Meter Data Collector (Foundation Model FZ100C)

The optional Meter Data Collector communicates with Foundation's built-in Meter Data Receiver. The collector attaches to the meter provided by your electricity provider where it gathers consumption information and transmits it to the Foundation thermostat.

For complete installation instructions, see the *Meter Data Collector Installation Guide*.

For troubleshooting information, see 9.4 Troubleshoot the Link to the Meter Data Collector and 9.5 Troubleshoot the Meter Data Collector Hardware.

7.6.1 Pairing the Foundation Thermostat and Meter Data Collector

The Meter Data Collector works with Foundation Model FZ100C only.

Note: To successfully pair the thermostat and Meter Data Collector, you may need to repeat the following steps after fine-tuning the placement of the collector's optical sensor.

For information on installing and adjusting the optical sensor's placement, see the *Meter Data Collector Installation Guide* and 9.4 Troubleshoot the Link to the Meter Data Collector.

1. Ensure the Foundation thermostat is powered up.
2. Confirm that the Meter Data Collector is installed correctly as described in the *Meter Data Collector Installation Guide*.
3. In Foundation's Installer Setup menu, select **Meter Data Collector**.
4. Select **Pair with Collector**.
5. Select **Yes** to confirm you want to start the pairing process.
6. When prompted, enter the Installer password. The default password is **INST**.

   The thermostat displays "Resetting" for a few seconds and then displays the Meter Data Collector menu.

   The Link Info screen displays "Pairing with Collector" for up to 2 minutes.
7. To complete the connection, press the Reset button on the Meter Data Collector within a minute of initiating the pairing process at the thermostat.

   The red STATUS indicator starts flashing regularly, indicating that the optical sensor has detected the signal from your meter.
   Within 1 minute, the indicator starts to flash irregularly to indicate that the sensor is reading the meter's output correctly.
8. In the Meter Data Collector menu, select **Link Info**.

   If the pairing is successful, within a few minutes, the Link Info screen displays the message "Connection Active".

9. If "Connection Active" is not displayed, see the troubleshooting information in 9.4 Troubleshoot the Link to the Meter Data Collector.

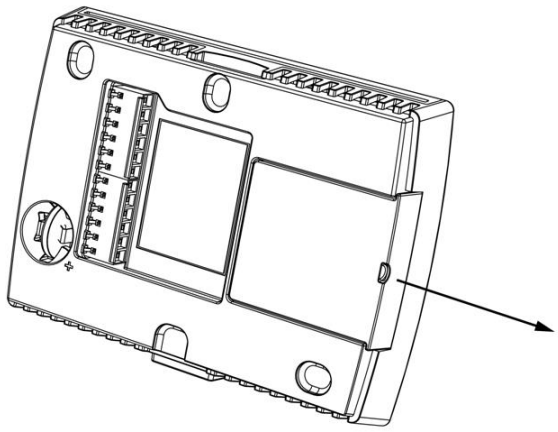
7.7 Pager Module (Foundation Only)

The optional pager module allows electricity providers to communicate remotely with the Foundation thermostat, using a FLEX pager radio network.

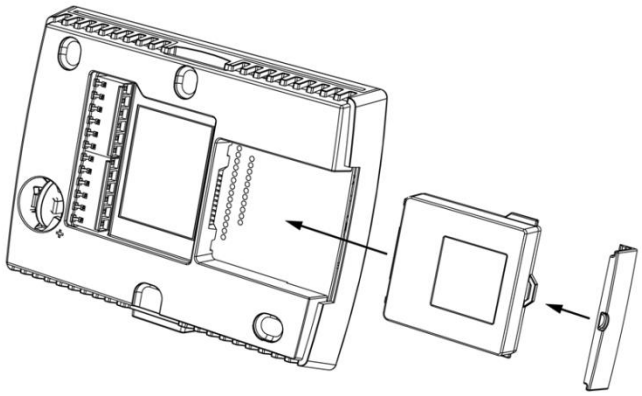
The pager module ships with a cover that replaces the filler plate in Foundation's casing after the module is installed.

7.7.1 Installation

1. To begin the module installation, remove Foundation from the mounting bracket, even if it is not mounted on a wall. See 3.2.4 Removing the Foundation Thermostat from the Mounting Bracket.
2. Locate the covered module slot on the back of Foundation. Use a small, flathead screwdriver to remove the filler plate.



3. Slide the module into the slot, ensuring that the tabs that position it are at the bottom, against the circuit board. Ensure that the module's pin connector is completely inserted.



4. Snap the supplied cover over the tab end of the module slot. It should be flush with the side of the Foundation casing.
5. To re-attach Foundation to the mounting bracket, position Foundation in the bottom of the bracket using the bottom snap-fit tab. Gently push Foundation into the rest of the bracket until the top tab snaps into place.
6. Wait for Foundation to power up.
7. From the Thermostat main menu, navigate to the **Installer Setup** menu.

When the pager module is installed and working properly, the **Pager** option is displayed in the Installer Setup menu. Use this option to access information about the module's connection to the network and other troubleshooting information.

7.7.2 Pager Signal Status

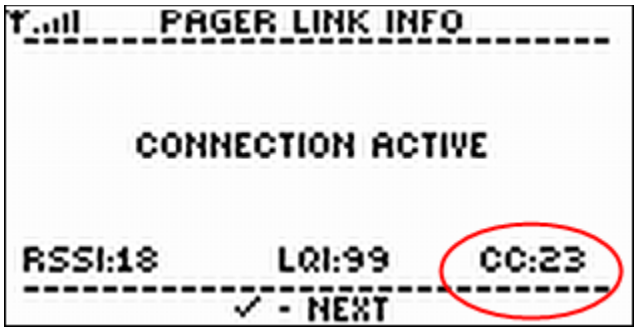
The pager module cannot receive messages or DR events until it is provisioned using Energate's Consumer Connected Demand Response™ (CCDR).

After the pager module is provisioned, the radio link status indicator at the top right of the Temperature or Energy home screen displays the status of the pager signal. The following indicators can be displayed to the right of the signal quality bars:

- **F:** A pager module is installed and configured.
- **D:** Both a pager module and a ZigBee network are configured.
- **Z:** A ZigBee network only is configured.

7.7.3 Pager Link Information

Use the Pager menu's **Link Info** option to display information such as connection status, radio signal strength, and hardware information. A two-digit confirmation code (CC) that confirms that you have successfully provisioned the pager module is displayed in the bottom-right corner of the Link Info screen.



The first Pager Link Info screen displays the current status of the pager module's connection to the network:

Message	Description	Response
CONNECTION ACTIVE	Foundation is connected to the pager network, successfully provisioned and receiving messages.	--
SEARCHING FOR NETWORK	The pager module is working but is unable to detect the pager network.	Contact Technical Support. See 13 Energate Technical Support.
NETWORK LOST	The pager module is working and was previously connected to the network, but is no longer communicating with the network.	Contact Technical Support. See 13 Energate Technical Support.
PAGER HARDWARE ERROR	There is a problem with the pager module related to its hardware or configuration. For example, the installed module is not supported, cannot be enabled, or has reset itself.	Contact Technical Support. See 13 Energate Technical Support.
WAITING FOR COMMISSION	The pager module is working, has detected the pager network, and is waiting to be provisioned.	For information on provisioning the pager module, see the *CCDR-LMS guide*
WAITING FOR BEACON	The pager module is connected to the pager network but is waiting for a beacon signal from the network. Foundation cannot be provisioned until it receives the beacon signal.	For information on provisioning the pager module, see *CCDR-LMS guide*

For more information on troubleshooting, see 9.6 Troubleshoot the Pager Module Installation.

7.8 Wi-Fi Module

The Wi-Fi Module enables wireless, two-way communication with your utility through a Wi-Fi network. It can be used with any Energate Foundation 1.3 or 1.4 thermostats (Firmware v3.4 or v3.5). The Wi-Fi module acts as an alternative to the ZIP Connect IP-ZigBee gateway and allows the Foundation thermostat to act as an IP-ZigBee gateway for other Energate devices. The Wi-Fi module can also be used as an alternate communication path when the Foundation is joined to a ZigBee meter to enable the Consumer Portal.

7.8.1 Installation

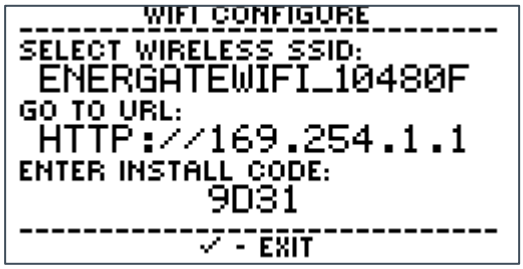
The Wi-Fi module is similar to the pager module in size and shape and can be physically attached to the thermostat using the same steps described for the pager module in section 7.7.1 Installation.

Note: After the Wi-Fi module has been correctly attached, the **Wi-Fi** option should become available in the **Installer Setup** menu.

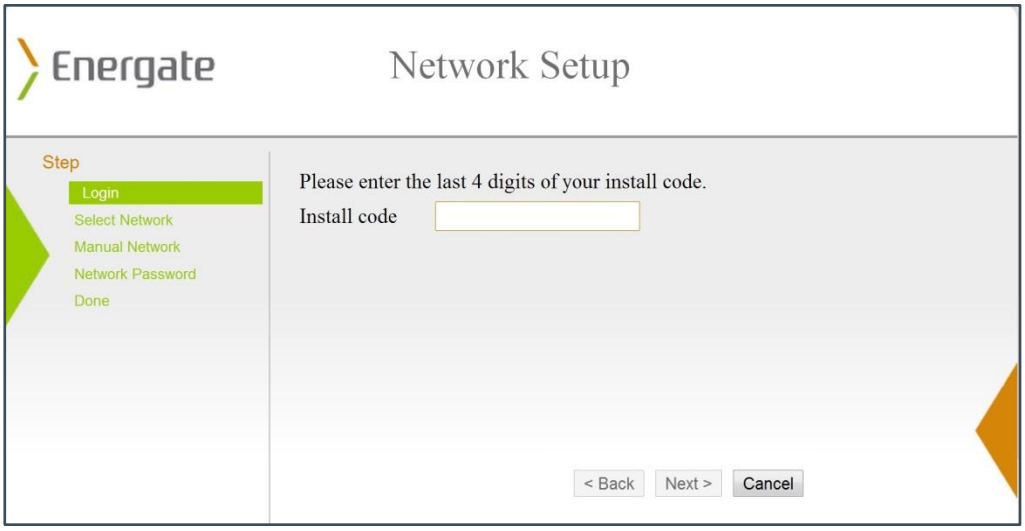
7.8.2 Connecting the Foundation Thermostat to the Wireless Network

To connect the Foundation thermostat to the Wi-Fi network:

1. From the thermostat main menu, navigate to the **Installer Setup** menu**.** Select the **Wi-Fi** option from the installer setup and then select **Configure Wi-Fi**.
2. Read the instructions displayed on the thermostat screen and press the select button to proceed.
3. The thermostat should ask if you want to start ADHOC/SETUP mode, scroll to Yes and press the Select button.
4. While the thermostat is in ADHOC/SETUP mode you will see the following screen that shows the wireless SSID, URL and Install Code as shown below. Make note of the given information and ensure the thermostat remains in ADHOC/ SETUP mode.



5. Using a laptop or any Wi-Fi enabled device, go to the list of wireless Wi-Fi networks and select the Energate Wi-Fi network (which was recorded in step 4).
6. Enter the URL in the address field of your web browser and the following page should open.



7. Enter the last 4 digits of the thermostat install code in the provided space and click Next.
8. Select your wireless network from a list of wireless Wi-Fi networks.

9. Enter your network password when prompted and click Next. Your Foundation will automatically leave ADHOC /SETUP mode.
10. On the thermostat WiFi menu, select **Link Info** and verify that the thermostat has successfully connected to the Wi-Fi network. The following screen should appear indicating that the connection is active.

7.8.3 Wi-Fi Signal Status

The Wi-Fi module cannot receive messages or DR events until it is provisioned using Energate's Consumer Connected Demand Response™ (CCDR).

After the Wi-Fi module is provisioned, the radio link status indicator at the top right of the Temperature or Energy home screen displays the status of the Wi-Fi signal. The following indicators can be displayed to the right of the signal quality bars:

- **W:** A Wi-Fi module is installed and configured.
- **D:** Both a Wi-Fi module and a ZigBee network are configured.
- **Z:** A ZigBee network only is configured.

8 Testing the System

8.1 Conventional System Test

Use temporary hold to bypass delays associated with the minimum on or off times.

Output to test	Procedure	Expected Result
Fan	Mode = OFF Fan = change from AUTO to ON	Fan should turn on
1ST stage cooling	Mode = COOL Lower the setpoint to at least 3°F (2°C) below room temperature, and then press ACCEPT to engage HOLD	First stage cooling should engage
2ND stage cooling*	Remain in COOL mode, lower the setpoint by at least one degree (°F or °C), and then press ACCEPT.	Second stage cooling should engage
1ST stage heating	Change mode to HEAT, rise the setpoint by at least 3°F (2°C) above room temperature, and then press ACCEPT.	First stage heating should engage
2ND stage heating**	Remain in HEAT mode, raise the setpoint by at least one degree (°F or °C), and then press ACCEPT.	Second stage heating should engage

* Only in two-stage cooling systems.

** Only in two-stage heating systems.

8.2 Heat-Pump System Test

Use temporary hold to bypass delays associated with the minimum on or off times.

Output tested	Procedure	Expected Result
Fan	Mode = OFF Fan = change from AUTO to ON	Fan should turn on
1ST stage cooling	Mode = COOL Set the setpoint to at least 3°F (2°C) below room temperature, and then press ACCEPT to engage HOLD.	First stage cooling should engage
2ND stage cooling*	Remain in COOL mode, lower setpoint by at least one degree (°F or °C), and then press ACCEPT again.	Second stage cooling should engage
1ST stage heating	Mode = HEAT Set the setpoint by at least 3°F (2°C) above room temperature, and then press ACCEPT	First stage heating should engage
2ND stage heating*	Remain in HEAT mode, raise setpoint by at least one degree (°F or °C), and then press ACCEPT again.	Second stage heating should engage.
Heating using Auxiliary Heat**	Remain in HEAT mode, raise setpoint by at least one degree (°F or °C), and then press ACCEPT again.	Auxiliary heating should engage (if there are more heat stages than cool stages)

* Only in two stage heat pump systems.

** Only with Heat-Pump systems equipped with an Auxiliary Heater

9 Troubleshooting

9.1 Troubleshoot the Thermostat Installation

If you suspect there is a problem with the thermostat unit, please ensure you have completed all of the following steps before you contact Technical Support and start the Return to Material Authorization (RMA) procedure.

9.1.1 The thermostat not does not power up (turn on)

1. Verify that both C and R are wired correctly.

   If a C or a common wire (that is, a ground wire) is missing, see 6.1 No Common Wire at Thermostat.

2. If C and R are wired correctly, confirm that the voltage between C and R is between 20 and 30 VAC.
3. Confirm that C is not a floating common wire (ground) and that it is from the HVAC equipment.
4. Confirm that the panel is not removed from the HVAC equipment.
5. Confirm that the HVAC equipment is receiving power.
6. If the unit still does not power up after confirming that everything is set up correctly, replace the thermostat with another Energate thermostat of the same model.
7. If the replacement thermostat powers up, contact Technical Support (see 13 Energate Technical Support) and begin the RMA procedure (see

8. 10 Return Merchandise Authorization (RMA) Procedure).

9.1.2 W, G, or another output does not energize (equipment does not turn on)

1. Check the wiring on the thermostat backplate. Confirm all outputs are wired correctly.
2. If the equipment still does not turn on, perform the Conventional or Heat Pump System Test. See 8 Testing the System.
3. If all of the other outputs do not operate correctly, wait 5 minutes. Some equipment engages only after a delay.
4. If all of the other outputs do not turn on after 5 minutes, remove the thermostat front plate. Jumper the output that is not operating and the R to energize the output at 24 VAC.
5. If the output energizes, contact Technical Support and start the RMA procedure. See 13 Energate Technical Support and

6. 10 Return Merchandise Authorization (RMA) Procedure.
7. If the output does not energize, it is likely a wiring or an equipment problem. Confirm that the equipment is operating correctly.
8. If the equipment is operating properly, prepare to test for faulty wiring by turning off the HVAC equipment. Substitute the wiring at both the HVAC equipment and at the thermostat with a wire you have confirmed is working, if available. Also confirm that the wiring is proper thermostat wiring. For example, if G is working but W is not, rewire the G wiring for use on W.
9. Turn the equipment back on. If W does not work while using the good wiring from G, it is likely an HVAC equipment issue. Recommend to the homeowner that they have an HVAC service technician service their equipment.
10. If W does work while using the good wiring from G, it is a wiring issue. If there is an unused wire, test the wire using the method above and use it for the output.
11. Remove the jumper. Put the thermostat front plate back on. Perform the appropriate Conventional or Heat Pump System test (see 8 Testing the System) and confirm that all outputs are now functioning correctly.

9.3 Troubleshoot the ZIP Connect

9.3.1 Power failure or loss of Internet connectivity

In the event of a power failure or a loss of Internet connectivity, please check the connections. The ZIP Connect automatically reconnects when the power or Internet connectivity is restored.

9.3.2 Both green and amber lights are off

First, verify that your electrical outlet has power by plugging another device such as a table lamp into it. Next, check that the power adapter is plugged in and connected to the ZIP Connect. If the POWER light is still not lit, contact Technical Support (see 13 Energate Technical Support).

9.3.3 LINK light is off or flashing regularly

When it is steadily lit, the LINK light indicates that the ZIP Connect is connected to the website provided by your electric utility (for example, Energate's LMS). If the light is off or flashes regularly, do the following:

- Check the Ethernet cable and ports to ensure that the ZIP Connect and router are properly connected. Ensure that the amber light on the ZIP Connect's Ethernet jack is illuminated.
- Confirm that your router is powered up and is working properly (for example, that you can use it to access the Internet via a computer).
- Unplug the ZIP Connect, wait for approximately 3 seconds, and then plug it back in.
- Confirm that the LINK light is now solid, which indicates that a reliable connection to the utility website is established.
- Confirm that the ZIP Connect was successfully provisioned via the utility website. (For example, if you use LMS, on the Provision Devices Details page, use the **Status** option for the ZIP Connect to confirm it is online.) For more information, see **Error! Reference source not found.**.

Please note that once the Internet connection is re-established, it can take several minutes for the ZIP Connect to reconnect with the Internet service provider and for the LINK light to stop flashing and remain steadily lit.

9.3.4 POWER light is flashing regularly

This indicates that the ZIP Connect is temporarily allowing Home Area Network (HAN) devices to connect to it. You can enable this mode by pressing the JOIN button or the utility can enable it remotely. This mode is cancelled automatically after four minutes.

9.3.5 POWER light is flashing irregularly

Green light (labeled POWER, also indicating HAN status) on an irregular flash cycle (green light illuminates for 5 seconds every 30 seconds) indicates that the ZIP Connect is not currently connected to any other ZigBee device, and is searching for a HAN to join.

9.3.6 Unable to connect a device

First, ensure that the LINK light is illuminated but not flashing. If it is flashing, make sure that the device is in a good location (that is, away from other wireless equipment and solid objects such as computers, televisions and walls).

If the LINK light is illuminated but not flashing, try adding to the amount of time that the ZIP Connect allows a device to connect. When you provision devices using the utility website, ZIP Connect allows devices to connect to it for four minutes. Connecting a device can take longer in environments where there is interference from other wireless devices or other barriers (for example, metal siding or electrical appliances).

To restart the mode that allows devices to connect, press the ZIP Connect JOIN button. Press it again as needed until the device is connected.

If pressing the JOIN button does not resolve the problem, please contact Technical Support (see 13 Energate Technical Support).

9.4 Troubleshoot the Link to the Meter Data Collector

9.4.1 The Meter Data Collector Link Info screen continues to display "Pairing with Collector" five minutes after pairing was enabled

1. Fine-tune the optical sensor placement by realigning the Meter Data Collector to ensure it is covering the optical port on the meter.

   If the clamp that holds the Meter Data Collector to the meter is too tight, it can interfere with proper alignment of the sensor head and create communication problems.
   For more information on installing and adjusting the optical sensor's placement, see the *Meter Data Collector Installation Guide*.

2. Repeat the pairing procedure. See Section 7.6.1 Pairing the Foundation Thermostat and Meter Data Collector.

9.4.2 The Meter Data Collector Link Info screen continues to display "Pairing with Collector" after fine-tuning the optical sensor placement

1. Try adjusting the collector again. It may require several attempts before the pairing is successful.

   For information on installing and adjusting the optical sensor's placement, see the *Meter Data Collector Installation Guide*.

2. After several attempts, if pairing is still unsuccessful, try turning on an electric appliance that consumes a large amount of power such as a stove or dryer.
3. Repeat the pairing procedure.
4. If it is still unsuccessful within a few minutes, then the collector is likely not aligned correctly on your utility meter.
5. Repeat the alignment procedure.

9.4.3 The Meter Data Collector Link Info screen continues to display "Pairing with Collector" after fine tuning the optical sensor placement and turning on an electric appliance that consumes a large amount of power

1. Confirm that the batteries are inserted using the correct orientation. The + and – symbols are printed on the green circuit board inside the battery compartment.
2. Confirm that the batteries are not dead. Lithium batteries are recommended for longer life in freezing conditions.
3. Confirm that the battery lid is closed and screwed down. The lid has to be fastened down for the batteries to make contact.

9.4.4 I have tried all of the troubleshooting procedures and the Meter Data Collector is still unable to pair with the Foundation thermostat

1. Remove the Foundation thermostat from the wall.
2. Take a second Foundation backplate and wire it so that it is powered by a portable 24 VAC power adapter. Current consumption on the power adapter should be under 500 mA.
3. Move the Foundation closer to the Meter Data Collector but not within 10 feet (3 m) of the collector.
4. Plug the power adapter into the wall and confirm that the Foundation thermostat powers up.
5. Once powered up, use the Meter Data Collector menu to repeat the pairing procedure.
6. If Foundation is able to pair with the collector, disconnect the power to the Foundation thermostat, remove it from the second backplate and place it back in its original backplate on the wall. Confirm that the thermostat remains paired with the collector by ensuring that the Meter Data Collector Link Info screen displays the message "Connection Active".
7. Once it is paired, the Foundation thermostat should begin receiving consumption data from the collector within a few minutes.
8. If the Foundation is still unable to pair with the collector and displays "Searching for Collector" for more than 5 minutes, contact Technical Support. See 13 Energate Technical Support.

9.5 Troubleshoot the Meter Data Collector Hardware

9.5.1 After installing the Meter Data Collector on my meter and pressing the Reset button, the red indicator does not light up

The Status light on the collector should light up solid red within 10 seconds after pressing the Reset button. If it does not, try these steps:

1. Confirm that the batteries are inserted using the correct orientation. + and – symbols are printed on the green circuit board inside the battery compartment.
2. Confirm that the batteries are not dead. We recommend lithium batteries for longer life in freezing conditions.
3. Confirm that the battery lid is closed and screwed down. The lid has to be fastened down for the batteries to make contact.

9.5.2 The red Status indicator on my Meter Data Collector is flashing rapidly

The Status indicator starts flashing very rapidly if the collector still has not detected the meter's signal within 20 minutes of being powered up. This is normal. Simply press the Reset button and wait 10 seconds for the Status indicator to light up solid. You can then proceed with the installation.

9.5.3 My Meter Data Collector Status indicator is flashing regularly, but every now and then, there is an extra flash

This is exactly what you should see. Electronic meters produce one single pulse every time you have consumed one watt-hour. When the sensor first detects a pulse from an electronic meter, the Status indicator starts flashing. Thereafter, the indicator keeps on flashing at the same frequency, but in addition, it flashes once every time it reads a pulse from your meter, at intervals that vary according to your current rate of electricity consumption. Thus, irregular flashing is absolutely normal.

9.5.4 The Meter Data Collector battery indicator shows a low battery level, but I installed fresh batteries not long ago.

Regular alkaline batteries can become exhausted very rapidly when it is extremely cold outside. If you are expecting an extended period of temperatures below -20°C (-4°F), try using lithium type AA batteries in the Meter Data Collector. These batteries are commonly available and they provide better performance in cold weather.

9.5.5 Foundation's Meter Data Receiver appears to be communicating with the Meter Data Collector, but the home screen displays HVAC and not "HOME" as the consumption data source

This indicates that the Foundation thermostat is not receiving transmissions from the Meter Data Collector. Ensure that Foundation is located within 100 feet (30 m) of the collector. Each interior wall and/or floor of your house reduces the range by approximately 10-15 feet (3-5 m). Exterior walls with wood framing and/or wood or vinyl siding reduce range by approximately 15 feet. Large metal or electrical barriers and exterior aluminum siding, stucco or can reduce effective range even further. Range is also reduced by cold weather and as the batteries lose their charge.

If exterior aluminum or stucco siding is present, try to move the thermostat so that there is a window between it and the Meter Data Collector.

If neither range nor wall construction seems to cause be the problem, repeat the steps for pairing the Meter Data Collector with the Foundation thermostat to re-synchronize them. See Section 7.6.1 Pairing the Foundation Thermostat and Meter Data Collector. When you press the Reset button, ensure you hold it for at least 5 seconds.

Lastly, it is possible that the batteries in the Meter Data Collector are exhausted. In the **Installer Setup** menu, use the Meter Data Collector **Link Info** option to check the battery strength. If the Batt value on the first Link Info screen is Low, replace the batteries with fresh ones.

9.5.6 Foundation's Meter Data Receiver appears to be communicating with the Meter Data Collector, but the Current Use value on the Energy home screen is 54 watts

Turn on an appliance in the home that uses a lot of electricity, such as an electric stove or dryer. If turning on this appliance does not increase the Current Use value, the optical sensor on the Meter Data Collector may not be properly aligned with the optical port on the electricity meter.

Add an additional shim to a maximum of two shims and repeat the steps for positioning, adjusting and establishing communications with the sensor found in the *Meter Data Collector Installation Guide*.

9.5.7 The consumption information shown on my Foundation thermostat is not correct and it jumps randomly

Several factors can affect the accuracy of the information shown on your thermostat and they all relate to interference.

If neighbours also have a Meter Data Collector, you may be receiving their information. In this case, you need to repeat the pairing process to change the collector address and resynchronize the thermostat. Repeat the steps in the *Meter Data Collector Guide*, but press and hold the Reset button for five (5) seconds. The Meter Data Collector then randomly selects a new address for the synchronization.

Wireless devices, such as weather stations or old-style baby monitors and cordless phones, transmit information on frequencies similar to the Meter Data Collector. If you have a wireless weather station, try turning it off briefly and check to see if the Foundation thermostat returns to normal operation. If it does, then check to see if you can change the weather station's operating channel.

9.5.8 The total shown on my Foundation thermostat does not match the total shown on my electricity bill

In order for the two totals to match, clear the totals on the Foundation thermostat on the exact day and time that the utility company reads your meter. In addition, your electricity bill also may include other fees and any applicable taxes.

The total amount shown on the thermostat is accurate, but it is really meant as a reference to indicate how much power you have consumed since you last cleared the totals. For example, if you clear the totals at the beginning of the month, you can use the Foundation thermostat to compare against your monthly budget.

9.6 Troubleshoot the Pager Module Installation

9.6.1 How do I know if the pager module was installed correctly?

When the pager module is installed correctly, the Pager option is displayed in the Installer Setup menu.

9.6.2 The pager module appears to be installed correctly but the Pager menu option is not displayed

Confirm that you are using a version of the Foundation thermostat which supports Pager Module (Firmware v3.4.x.x does not support Pager). If you are using a version that supports the pager module, there may be a problem with the pager module. Please contact Technical Support (see 13Energate Technical Support).

9.6.3 The pager module is installed correctly and the Pager menu option is displayed, but an "X" is displayed instead of the link status signal strength bars

In order to display the signal strength bars, the pager module must receive a beacon signal from the pager transmitter. This is typically transmitted immediately when you provision a pager module and once per hour after that.

If the signal strength bars are not displayed within a few minutes of provisioning, perform the following steps until the thermostat displays them:

1. Remove the thermostat from the wall and remove the pager module. Then, install a second pager module, place the thermostat back on the wall and repeat the provisioning procedure.
2. If after a few minutes the bars are still not displayed, the area where the Foundation thermostat is installed may not have pager service or there may be an issue with the pager antenna. Contact Technical Support (see 13 Energate Technical Support).

9.7 Troubleshooting the Wi-Fi Module Installation

9.7.1 How do I know that the Wi-Fi module is correctly inserted and attached to the thermostat?

When the Wi-Fi module is correctly inserted, the **Wi-Fi** option is displayed in the **Installer Setup** menu.

9.7.2 The Wi-Fi module appears to be inserted correctly, but the Wi-Fi menu option is still not displayed

Toggle between the Settings and the Installer Setup menu a few times. If it still has yet to appear, there may be a problem with the Wi-Fi module. Please contact Technical Support (see 13 Energate Technical Support).

9.7.3 I cannot see Energate's Network Formed by the Thermostat.

You may have an older version of the Wi-Fi Module, RM41W, which uses an Adhoc Connection. Adhoc is not supported on some devices such as: Android Devices and Windows 8.1. Please try using a device which supports AdHoc mode and see if the thermostat's network is detected. Some examples of devices which support Adhoc mode are: Windows 7 PC's, iPhones, iPads.

9.7.4 My web browser does not open the web page when I enter the URL

There may be a small time delay before the web page is available, please wait 2 minutes and try again. If you cannot connect after 2 minutes, your Computer or Wi-Fi enabled device is not connected to Energate's thermostat wireless network. Please select and connect your device to the Energate Wi-Fi network. If the problem persists, try using another web browser or wireless device.

9.7.5 The following message is displayed after you select your network on the web setup page: "There was an error configuring to join your network. Please try again."

a. Verify that your network's SSID (Network Name) is not more than 31 characters. If it is, edit your SSID to be less than 31 characters.

   If you would prefer not to edit your router SSID, you can log into your router and set up a guest network with a shorter SSID for your thermostat to connect to.

b. Repeat the configuration process (Steps 1- 10). If this error message still shows up on your browser after step 8, please contact Technical Support.

9.7.6 When I check the link Info, I see an error message instead of "Connection Active"

a. You may have either selected the wrong wireless network or entered the wrong password. Repeat the configuration process (Steps 1-10) to resolve the issue. If this does not resolve the problem, proceed to next step.
b. If you are using the RM42W Module, you may skip this step. Otherwise, login to your router settings and ensure that the Network mode is **NOT** set to "N only" "B, G, N mixed" is preferred. You may need to refer to your Wi-Fi router manual.
c. Reboot the router. Check that the status message on the **WiFi Link Info** screen has changed to "Connection Active" if not, proceed to the next step.
d. If you still have "Error" on the **WiFi Link Info** screen, please contact Technical Support.

9.7.7 When I check the link info, it says "Searching for ESP"

To resolve this problem follow the following steps:

a. Power Cycle your Wi-Fi router and check the WiFi Link Info screen again to see if this resolves the problem. **If you are using the RM42W Wi-Fi module please skip to step e, otherwise, continue the following steps**.
b. If you have a cable modem, log into your Wi-Fi router and change your DHCP Response to enable Unicast (Internet Settings), and disable "Always Broadcast" (Network Settings). You may need to refer to your Wi-Fi router manual.
c. If you have a DSL modem, log into your Wi-Fi router and disable your PPoE Auto Reconnect setting. You may need to refer to your Wi-Fi router manual.

d. Log into your Router and ensure that the Channel Width is set to 20MHZ **NOT** Auto. This option is usually located in the Wireless Network Settings of your router. You may need to refer to Wi-Fi router manual.
e. Reboot the router. Check that the status message on the **WiFi Link Info** screen has changed to "Connection Active" if not, proceed to the next step.

If all steps fail to fix the problem, please contact Technical Support (see 13 Energate Technical Support).

9.7.8 My Wi-Fi link info reports "CONNECTING" instead of "CONNECTION ACTIVE"

a. **If you are using the RM42W Wi-Fi module please skip to step e, otherwise, continue the following steps**.
   Log into your Router and access the wireless network settings.
b. Ensure that the Security Encryption in your Wi-Fi router settings is **NOT** set to TKIP. AES is preferred in some router models.
c. Ensure that the security type is set to WPA2 Personal or WPA personal not mixed mode. The WiFi module may not support WPA/WPA2 mixed mode in some routers for example: Cisco Linksys EA3500.
d. Login to your router settings and ensure that the Network mode supports 80211.B. It should **NOT** be set to "N only", "G only" or "N, G only" – "B, G, N mixed" is preferred. You may need to refer to your Wi-Fi router manual.
e. Reboot the router. Check that the status message on the **WiFi Link Info** screen has changed to "Connection Active" if not, proceed to the next step.
f. If you still have "Connecting" on the **WiFi Link Info** screen, please contact Technical Support.

10 Return Merchandise Authorization (RMA) Procedure

Before you request permission to return equipment that appears to be defective, perform the troubleshooting steps described in 9 Troubleshooting.

Technical Support requests the following information:

- Product description (LC 301Z load switch, AS 20 Auxiliary Switch, FZ100 Foundation, and so on)
- Serial number and MAC address for each device to be returned
- Date and reason for return
- List of tests and troubleshooting steps that you performed before contacting Technical Support and the results
- A contact name and phone number
- Other additional information, as required

Technical Support requires the RMA information and provides it to the RMA department. The RMA department reviews the recorded details and assigns an RMA number if the return is approved.

Record the RMA number and send the equipment to:

RMA# (specify RMA number)

Energate Inc.
c\o RMA Department
2379 Holly Lane, Suite 200
Ottawa, Ontario, Canada
K1V 7P2
1-877-908-0010

rma@energateinc.com

After it receives the equipment, Energate performs a root cause analysis on it. If a problem is found, corrective action is undertaken.

The RMA department then provides an estimated time for completing the repairs or replacing the equipment that was assigned the RMA No.

Note: An RMA No. is required for all returned equipment.

11 Unsupported Configurations

The following configurations are not supported by Pioneer and Foundation thermostats.

11.1 Heat Pump with Two or More Additional (Auxiliary) Stages

Energate thermostats support only one additional stage of heating in addition to two heat pump stages. If there are two or more additional stages of heating in addition to the heat pump stages, it is recommended that you wire-in the most desirable auxiliary stage. The other auxiliary stages are not used.

11.2 Multi-Zone Thermostats

Individual Energate thermostats do not support multiple zones. Multi-zone functionality must be implemented using a zone controller, such as a zoning panel, or you can use a separate thermostat for each zone. See 6.2 Zone Control Systems.

11.3 Proprietary Communication Protocols between HVAC Equipment and Thermostats

Several manufacturers use proprietary communication protocols to allow the thermostat and HVAC equipment to communicate (for example, Carrier Infinity, Bryant Evolution, and the fully modulating Ruud/Rheem systems). Unless otherwise noted, those communication protocols are not supported by Energate.

11.4 Line Voltage Systems

Energate does not support electric baseboards and other systems that use 120-volt or 240-volt power. Only 24-volt HVAC systems are supported.

12 Frequently Asked Questions

12.1 Installation Questions

12.1.1 What if there are two R wires for the old thermostat (Rh and Rc)?

See 6.1.3 Dual Transformer Equipment.

12.1.2 What if there is no common (ground) wire to the thermostat?

See 6.1 No Common Wire at Thermostat.

12.1.3 My home already has an outdoor temperature sensor. Can I use it with my Energate thermostat?

You can use your existing temperature sensor if it is compatible with the thermostat. See 7.2 Outdoor Temperature Sensor.

12.1.4 The thermostat occasionally displays the message, "Output short circuit. Check wiring."

This may indicate an intermittent short circuit. Check the wiring to make sure there are no corroded wires, worn wiring insulation, or loose connections. For additional wiring troubleshooting, see 9.1 Troubleshoot the Thermostat Installation.

12.1.5 What if the Energate thermostat does not cover the hole where the previous thermostat was installed?

Use an Energate wall plate to cover the hole in the wall. See 7.1 Wall Plate.

12.1.6 Why is the thermostat screen blank?

Check the wiring and confirm that there is adequate power and a proper common or ground wire. For wiring troubleshooting steps, see 9.1 Troubleshoot the Thermostat Installation.

If the screen is still blank after you have confirmed the wiring is correct, replace the thermostat and perform a Return to Material Authorization (RMA). See

10 Return Merchandise Authorization (RMA) Procedure.

12.1.7 How come the thermostat heat or cool animation symbol shows that it is on, but the furnace or AC is not running?

Check the wiring (see 9.1 Troubleshoot the Thermostat Installation). If the wiring is correct, replace the thermostat and perform a Return to Material Authorization (RMA) (see

10 Return Merchandise Authorization (RMA) Procedure).

12.1.8 What if my thermostat displays a Heat Pump Fault error message?

The heat pump has reported a fault condition to the thermostat. As a result, the thermostat has disabled its control of the heat pump. Until the fault is cleared, the thermostat engages only auxiliary heating (if available).

12.1.9 What if my thermostat displays a Please Change Filter error message?

Either the change air filter sensor in the HVAC equipment has been triggered or the Filter Reminder timer in the thermostat has expired. The error message is displayed on the thermostat display until either the equipment clears the sensor or you reset the timer from the Thermostat or Energy home screen.

12.1.10 Are Energate thermostats compatible with hydronic (water-based) systems?

Energate thermostats are optimized for HVAC equipment that uses forced air to heat and cool. The Energate control algorithms work best with these types of systems.

Energate thermostats also work with water-based or hydronic systems. The equipment in these systems uses water in the floor or radiators to heat or cool the home and take longer than forced air to change the temperature of a home. Energate thermostat algorithms are not optimized for water-based systems.

When water-based systems are controlled by an Energate thermostat, temperatures may be noticeably higher or lower than the target temperature more frequently or for longer periods of time.

To minimize this problem, it is recommended that you minimize the difference in temperature between setpoints (target temperatures) that follow each other in the schedule (for example, Wake and Leave). Minimizing the scheduled change in temperatures allows the HVAC equipment to reach and maintain target temperatures more easily.

12.1.11What communication technologies are supported by the Energate thermostat?

Pioneer and Foundation thermostats support the ZigBee protocol. Foundation models FZ100 and FZ100C also support the pager protocol when the optional pager module is installed.

12.2 User Questions

12.2.1 Why does the thermostat cause my equipment to come on more frequently than my old one?

The thermostat is optimized to maintain the temperature in a narrow range and to minimize it reaching temperatures well above or below the target temperature. Equipment may run more often than with an older thermostat that allows a wider temperature range.

To reduce the number of on and off cycles, use the **Equipment Settings** option in the Installer Setup menu to increase the minimum on and off time. However, with this type of adjustment, temperatures are likely to be higher or lower than the setpoint (target temperature) more often.

12.2.2 Why is the time wrong on the thermostat?

When communication is enabled, the thermostat gets the time from the electric utility and you cannot set the time manually. When communication is disabled, it operates using the time that is set via the User Options menu.

Check the signal strength indicator at the top of the Thermostat or Energy home screen. If it displays an X or signal strength of less than two bars, there may be a problem. Confirm that the ZigBee or Pager Link Info screen displays the message "Connection Active". (You access the Link Info screens from the Installer Setup menu.)

If the home is using a ZIP Connect, confirm that both the green (Power) LED and the orange (Link) LED are solidly lit. If the orange (Link) LED is flashing, it indicates that the device is not connected to the Internet. Check your Internet connection.

If the time is still wrong after following these steps, contact Technical Support (see 13 Energate Technical Support).

12.2.3 I don't understand how the schedule works

A schedule setpoint is made up of a start time and its target heat and cool temperatures. By default, the schedule consists of:

- Four weekday setpoints (Wake, Leave, Return and Sleep)
- Two weekend setpoints (Wake, Sleep)

Each day in a Foundation schedule can use two, four or no setpoints. Pioneer can use up to six setpoints per day. Each setpoint can contain only one heat and cool temperature setting (the target temperature). For example, to use a different heat temperature for Wake on the weekend, a different setpoint is required.

12.2.4 Why does the thermostat turn on before the scheduled setpoint time?

This is normal behavior for the default anticipation time, which is 60 minutes. The User Options menu allows you to change the anticipation time or set it to 0 minutes, which turns off the feature.

12.2.5 Why is the blue LED on?

The blue LED indicates that the thermostat setpoint temperature (for example, the scheduled target temperature) has been adjusted based on an energy or price conservation event.

- Energy Event is displayed for the signal sent when the electric utility needs to reduce energy consumption.
- Conservation is displayed for a price conservation event.

12.2.6 Why is the yellow, orange, or red LED on?

As the price of energy increases, the yellow, orange, or red LEDs light up (in that order). The red LED is lit when the price is very high.

Note that one or a maximum of two lights can be on at the same time (for example, blue and one of the yellow, orange, or red lights).

12.2.7 How do I temporarily override an energy event?

To create a temporary hold that overrides a voluntary event, adjust the temperature. If it is a mandatory event, you must contact your utility to request an override.

When you override an event, the blue LED turns off and the Temporary Hold is displayed.

12.2.8 How do I permanently override energy or price events?

For energy events:

- For Pioneer thermostats, on the **Energy Options** screen, set **Energy Event** to **Opt-Out**.
- For Foundation thermostats, on the Energy Settings menu, for the **Event Participation** option, choose **Ignore All**. (You access the Energy Settings from the Energy home screen.)

Note: Only voluntary events can be overridden.

For price events:

- For Pioneer thermostats, on the **Conservation** screen, select **Maximum Comfort**.
- For Foundation thermostats, on the **Conservation Settings** screen, select **Maximum Comfort**. To access the **Conservation Settings** screen, from the Energy home screen, press the Up ▲ or Down ▼ button.

13 Energate Technical Support

For additional help, please contact the Energate Technical Support team:

- Telephone: 1-877-908-0010 Monday to Friday from 8am to 8pm Eastern time, except holidays
- Email: support@energateinc.com, anytime